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ABSTRACT

The proceedings from a 1983 conference on sports and recreation for students with physical disabilities are presented. The major part of the proceedings consists of state of the art analyses on five topics (sample subtopics in parentheses): (1) ability assessment (fitness norms, energy cost of walking, wheelchair kinesiology, psychology of children with orthopedic disabilities); (2) sports and recreational activities and adaptations (competitive wheelchair sports, tennis and racquet sports, preparation for participation in winter sports, aquatic sports, horseback riding); (3) specific adaptive techniques (prosthetic adaptations, technology and recreational mobility); (4) injuries in wheelchair activities; and (5) availability (community programs, camp programs, winter sports programs, involvement of the U.S. Olympic committee). Forms and checklists are provided, as are outlines for program development and suggestions for promoting communication among organizations and individuals. Extensive appendixes include bibliographies and information on functional classifications for competition. (CL)

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Proceedings of the WINTER PARK SEMINAR WINTER PARK, COLORADO April 11–13, 1983

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SPORTS AND RECREATIONAL PROGRAMS FOR THE CHILD AND YOUNG ADULT WITH PHYSICAL DISABILITY

Proceedings of the
WINTER PARK SEMINAR
Winter Park, Colorado
April 11-13, 1983

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I. INTRODUCTION

This invitational seminar was held for representatives of the various disciplines involved in recreation and competition for children and young adults with physical disabilities, with the following goals:

1. to report on state-of-the-art current research about fitness, kinesiology, energy costs, and training techniques as they relate to this population;
2. to develop guidelines for assessment of children and young adults with specific physical disabilities and for appropriate sports and activities, their adaptations, and risks;
3. to share information, including audiovisual materials, about existing recreational and competitive programs;
4. to develop a means of continuing communication among the disciplines involved, including a data base of available individual and organizational resources, and a means to its continued updating and availability; and
5. to produce a document detailing the above in a useful form for physicians and allied health and community professionals working with this population.

This publication is a distillate of the information exchanged at that seminar. We hope all those who work in this growing field will find it useful. We who participated in this conference strongly believe, with others, that great benefits ensue from participation in recreation. We encourage you who read this to challenge your communities to provide these opportunities and your patients and families to grasp them and expand their worlds.

Mary Williams Clark, M.D.

Robert E. Eilert, M.D.

II. STATE-OF-THE-ART

A. Assessment of the Orthopaedically Disabled Child's Ability

1. Fitness Norms
   Joseph P. Winnick

2. Energy Costs of Walking
   Robert L. Waters

3. Wheelchair Kinesiology
   Cathy Walsh

4. Swimming for Children With Myelodysplasia
   Horst Strohkendl

5. Psychology of Children With Orthopaedic Disabilities
   Robert Rotella

FITNESS NORMS FOR ORTHOPAEDICALLY DISABLED CHILDREN

Joseph Winnick, Ed.D.

Physical fitness testing has received a great deal of attention from American physical educators since the research of Kraus and Hirschland in 1954 suggested that American children were less fit than European children. However, to date, no standardized quantitative tests have been available for children with orthopaedic conditions or auditory impairments. No "special" standards of modifications have been designed for use in connection with the Health Related Physical Fitness Test published by the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) in 1980. The PROJECT UNIQUE Physical Fitness Test, based on examination of 3,914 children was developed on the basis of data collected by 225 trained examiners in 23 states from June, 1979, to May, 1982.

The 2,722 disabled subjects were divided into auditory, visual, and orthopaedic (cerebral palsy, paraplegic and neuromuscular) categories. In the PROJECT UNIQUE test, body composition is determined by measurement of triceps and subscapular skin folds. Muscular strength and endurance are determined by measurement of grip strength, sit-ups, 50-yard/meter dash, and ball throw. Cardiorespiratory endurance is determined by a timed long-distance run. Flexibility is measured by forward trunk flexion, seated, with legs fully extended. The standing broad jump and arm hang are substitute items for certain groups. The reliability of these tests was confirmed by an alpha coefficient of 0.9 or better, except for the softball throw and the arm hang.

In conclusion, the PROJECT UNIQUE Physical Fitness Test is applicable to populations with orthopaedic or sensory impairments, as well as to children and adolescents without handicapping conditions.

REFERENCE:

Joseph P. Winnick: The Project Unique Physical Fitness Test for Normal, Sensory Impaired, and Orthopaedically Impaired Youth. Supported by Special Education Programs, U.S. Department of Education, Grant number G007902258, project number 023CH10058.

ENERGY COST OF WALKING WITH VARIOUS DISABILITIES

Robert Waters, M.D.

In the gait laboratory at Rancho Los Amigos, 200 children were studied by Waters and Perry to measure the energy cost of walking. Most of the energy for walking comes from aerobic oxidation of fats and carbohydrates. The oxygen consumed directly reflects the energy expended.

To measure physiologic demand, the child must reach a steady rate of walking, which usually takes three to four minutes. Oxygen consumption at that point reflects the amount of metabolic work.

Maximum aerobic capacity is the best single test of physical fitness and is determined by working on a treadmill or hand cranking device. The maximum aerobic capacity declines with age and is less in the arms than in the legs. Typically, a person can exercise for a long time at less than 50% of maximum aerobic capacity without exhaustion; above the 50% level, fatigue ensues earlier. Anerobic oxidation can produce energy, but only for short, high-intensity bursts because the lactate produced causes acidosis in the muscles.

Because standards for normal adults should not be used for children or teenagers, energy expenditure was measured in 114 able-bodied subjects between 6 and 19 years of age by having them walk on a level outdoor track. The track was used because a treadmill is difficult for children with disabilities. Heart rate, respiratory rate and step frequency were telemetered and expired air was collected in a modified Douglas Bag System. Oxygen consumption was higher (15.3 ml/kg-min) in children than adolescents (12.9 ml/kg-min). Heart rate was higher in children than adolescents. The average walking speed increased with age.

Thirty-five spastic diplegic children between 5 and 17 years of age were tested using walking aids as needed (3 forearm crutches, 5 quad canes, 6 walkers). Average walking speed was 57% of normal velocity. The heart rate was 30% higher because of reduced gait velocity and increased rate of energy expenditure. Whereas the rate of energy expenditure for walking decreased with age in the normal child, the opposite occurred in the spastic child. The older spastic child may prefer a wheelchair because increasing body weight means greater physical exertion to walk. Walking may become functionally unrealistic for the teenager because of high energy demand rather than lack of motivation.

Many myelodysplastic children walk with crutches, using either a swing through or reciprocal gait. To perform a swing though gait the individual must lift his entire weight up with the arms or shoulders. In examining 25 myelodysplastic children, a high rate of energy expenditure was present in those with a swing through gait, despite variation in the levels of paralysis.

In reciprocal walking the energetics closely correlated to the amount of muscular paralysis. Those children requiring two long leg braces walked the slowest, with improvement down to the S-1 level child with good hips, who walked the fastest.

Wheelchair propulsion required much less energy and was faster. With a four-week endurance training program, wheelchair users were able to increase their maximum aerobic capacity, as well as their endurance and speed.

REFERENCE: Waters, R.L., Hislop, H.J., Perry, J., Antonelli, D.: Energetics: Application to the study and management of locomotor disabilities. Orthop. Clin. North Amer. 9:351, 1978.

WHEELCHAIR KINESIOLOGY

Cathy Walsh, B.P.E.

Speed in wheelchair sports refers to the time required to cover a given distance. Speed is dependent upon the distance traveled per push multiplied by the pushing frequency. This is analogous to running speed calculated by multiplying stride length times frequency of strides. The wheelchair athlete, however, must be aware of the inverse relationship between distance traveled per push and the push frequency. To increase wheeling speed, there must be an increase in one parameter without a comparable decrease in the other.

The act of wheeling can be divided into two phases: the push or drive phase, during which propulsive forces are applied to the rim, and the recovery phase during which propulsive forces are not applied. The object of the push phase is to maximize the amount of force applied. Byrnes, at the University of Alberta, studied the elctromyography of upper extremity muscles of wheelchair athletes at the Pan American Games. All muscles of the upper extremity and pectoral girdle are active during wheeling. Therefore, well-designed resistance training programs for all upper limb girdle muscles will increase the potential force to be applied to the drive rim.

Another method of increasing the amount of force applied during the push phase is to increase the time over which forces are exerted. The length of the push is affected by arm length, trunk strength, hand function, shoulder flexibility, and chair design.

The function of the recovery phase is to allow the hands, upon release of the handrim, to move a quickly as possible to the position where they can begin the next push.

The following factors should be taken into consideration when designing a wheelchair: wheel size, handrim size, seat position (vertical and horizontal), and trunk position. The type of sport will also dictate chair design. Track chairs, for example, are characterized by large wheels (70 cm), small handrims, and low seats with a forward leaning trunk position. This design allows maximum contact in the handrims, maximum trunk stability and, thus, maximum speed. Basketball chairs, on the other hand, are generally constructed with smaller wheels (61 cm), larger handrims (53 to 56 cm), and a higher, more upright seat position to enhance mobility and to put the player closer to the basket.

Studies at the University of Alberta determined the optimum position of the seat in the horizontal plane to be that which placed the greater trochanter in line with, or slightly in front of, the axle. In this position, the track athlete can maintain the greatest amount of handrim contact and exert maximum trunk thrust. It has been generally accepted that slight forward lean is desired in wheelchair racing, but not to a degree that impairs trunk stability. Many athletes employ a custom molded bucket seat to enhance trunk stability, with newer designs in corporating ischial relief by increasing pressure on the thighs. Increased seat height allows more upper extremity force to be transferred to the wheel during the drive phase.

(contd.)

Much work still needs to be done in the area of wheelchair propulsion and wheelchair design. The area of children's chair design has yet to receive a great deal of attention. Many of today's disabled children have been forced to utilize chairs which do absolutely nothing to enhance performance. It will be important to the development of sport for disabled children that coaches and teachers become more aware of the basic principles of wheelchair propulsion, because these same principles apply to children. Only with suitable chairs will these children be able to achieve their maximum potential.

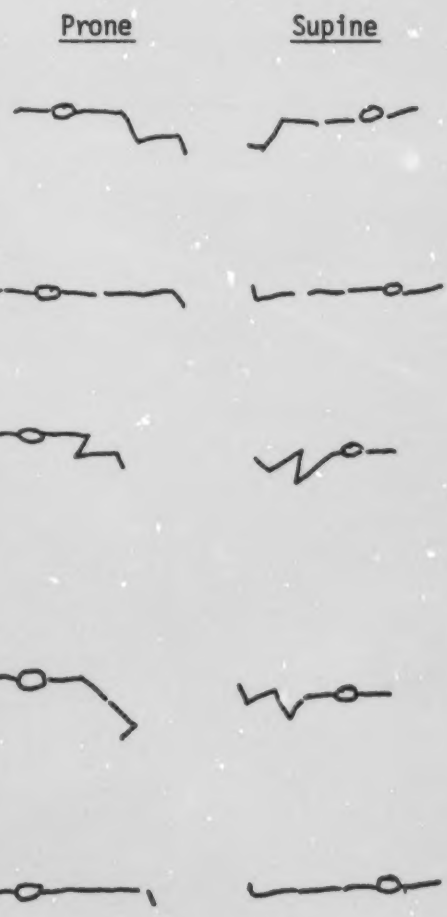
REFERENCE: Steadward, R.D. (ed.): Proceedings of the First International Conference on Sport and Training of the Physically Disabled Athlete. Alberta, Canada, Department of Physical Education, University of Alberta, 1979.

TECHNICAL ASPECTS OF SWIMMING FOR CHILDREN WITH VARIOUS LEVELS OF MYELODYSPLASIA

Horst Strohkendl, Ph.D.

The author has 10 years' experience in teaching swimming to children with spina bifida. The swimming lessons take place at a special school for physically disabled children in Cologne, Germany. The problems of hygiene are minimal when the toilets are used before swimming. As the individual lessons do not last more than 20 minutes, the production of urine is minimal. Water examined by an Institute of Hygiene reported no difference in the quality compared to pools in which non-disabled people swim.

Films of swimmers, including underwater views, document that buoyancy is better than that of able-bodied people and that body positions vary depending on the type and level of lesion.



Thoracic-level lesions with spastic lower limbs produce a body position of hips and knees flexed 90 degrees when prone, and hips straight with knees flexed 45 degrees when supine.

T10-L1 lesions with flaccid lower limbs: hips and knees are straight in both positions.

L1 and L2 lesions (with active hip flexors) produce the least streamlined, least efficient body position, with hips and knees flexed more than 100 degrees, both prone and supine.

L3 and L5 lesions with flaccid lower limbs: prone, the hips are flexed approximately 40 degrees, the knees are straight; supine, the back is lordotic, the hips are flexed more than 45 degrees, and the knees are flexed about 30 degrees.

Sacral-level lesions allow the body to assume a straight, streamlined position in the water.

(cont'd.)

Swimming techniques for myelodysplasia, Strohkendl (cont'd.)

The double breaststroke (breathing during every second stroke) is easiest to learn because the coordination pattern is simple, it maintains balance, and decreases water resistance. The symmetric backstroke is also easy to learn, but orientation of the swimmer is easier in the prone (breast) position.

Active use of legs, even if possible, should be discouraged as the predominance of hip flexor movements increases water resistance and decreases efficiency.

More advanced techniques for paraplegics are not simple able-bodied technique minus leg movements. The paraplegic must learn a new totality of arm and head movements. In alternating strokes, the non-pulling arm must serve for steering purposes.

Breaststroke: a double stroke is favorable, the breathing done during the pulling phase.

Dolphin: the arms must have good flexibility at the shoulders; trunk and leg movements are a disadvantage.

Free style: one arm is kept in a stretched position over the head for steering, the stroke is performed as near as possible to the midline of the body to maintain body position.

Alternating backstroke: one hand must be used for steering, both arms are for one moment under water.

Symmetric backstroke is favorable, with the head in extension.

REFERENCE: Body Position of Young Paraplegics in Water (movie)
Institut fuer Rehab. u. Behinderiensport
DJHS Koeln Carl Diem Weg
500 Koeln 41, West Germany

PSYCHOLOGY OF CHILDREN WITH ORTHOPAEDIC DISABILITIES

Robert Rotella, Ph.D.

The mind will play a most important role in determining the success and satisfaction of rehabilitation. Thoughts significantly influence motivation. Many individuals respond to a disability by thinking in a positive and growth-oriented manner, while others respond in a negative and self-defeating manner. Specialists in psychology and sport psychology have developed a wide variety of self-control strategies, typically labeled cognitive-behavioral techniques, which are most helpful in the development of effective thinking patterns. These techniques include cognitive restructuring strategies, such as through stoppage, self-talk modification, visual imagery (both mastery and coping rehearsal), rational emotive therapy, and various forms of relaxation training. Each of these strategies can better enable individuals to gain mastery over their situation.

Children with handicaps often have accepted their limitations and have learned to cope (consciously or subconsciously) with their limitations. They are often easier to teach because "they try harder." Many bring excitement to learning and a willingness to practice seldom seen in able-bodied students. Handicapped children often view themselves in a manner consistent with their parents' view of them. Parents who set unrealistically high expectations may cause the child to be frustrated and unsatisfied with his performance; whereas those with unrealistically low expectations may deprive the child of motivation necessary to undertake a challenging sport.

Three psychological issues should be considered: 1) fear of failure, 2) jealousy, and 3) visual imagery. Fear of failure is related to risk-taking. The child must be taught that failure is a part of human experience and that success is not possible without making an effort. Jealousy is self-defeating, and a goal of self-improvement is more important than envying another's accomplishments. Teachers must help students to enjoy the process of self-improvement, rather than constant direct competition against others. Visual imagery is a technique of having the athlete see in his "mind's eye" himself effortlessly and successfully performing a task. For example, a golfer may envision the flight of his ball and where it will land prior to starting his swing.

The performance of a handicapped child can often surpass others with much greater talent. For example, a child instructed in skiing may move better than 90% of the normal adults on the mountain, despite his handicap. This reflects the positive motivation so characteristic of many of these children.

To insure their success, they must accept responsibility for their success or failure. The children need to set goals that are challenging but attainable, and take the responsibility for attaining them.

Sports can help the child master many psychological skills, including emotional control, goal setting, positive thinking, and acceptance of human limitations.

REFERENCES: Rotella, R.J.: Systemic desensitization. Psychological rehabilitation of injured athletes. In Bunker, L., Rotella, R. (eds): Sport Psychology: From Theory to Practice. Charlottesville, Virginia, Department of Health and Physical Education, University of Virginia, 1978.

Rotella, R.J.: In The Injured Athlete. Daniel Kulund, editor. J.B. Lippincott, Philadelphia, 1982.

II. STATE-OF-THE-ART

B. Sports and Recreational Activities and Adaptations

1. Competitive Wheelchair Sports
   Kathleen Curtis, M.A., R.P.T.

2. Sports for the Cerebral Palsied
   Craig Huber, M.A.

3. Tennis and Other Racquet Sports
   Brad Parks

4. Preparation for Participation in Winter Sports
   Carol Page, R.P.T.

5. Winter Sports
   Duane Messner, M.D.

6. Aquatic Sports
   Louise Priest

7. Horseback Riding
   Lida McCowan

8. Outdoor Recreation and Holistic Health
   Howard Cohen, M.T.R.

COMPETITIVE WHEELCHAIR SPORTS

Kathleen Curtis, R.P.T.

The National Wheelchair Athletic Association (NWAA) and the National Wheelchair Basketball Association (NWBA) provide much of the organized opportunity for competition in the United States. The NWAA has 16 regions, each of which sponsors spring regional meets in track, field, slalom course, swimming, weight-lifting, table tennis, and archery. Athletes meeting qualifying standards may compete in the national competition in June of each year.

The NWBA comprises more than 150 teams, organized by conferences on a geographical basis. A regular basketball season is followed by regional and sectional tournaments, sending four teams to the national tournament each March.

Rules for most competitions are those for the able-bodied amateur sport, with modifications. Classification systems*, on the basis of disability, allow fair competition; these systems are based on a spinal-cord-injury model, but competitors also include athletes with amputations, polio, and other disabilities.

Many wheelchair athletes train year-round and are producing exciting performances, such as the metric mile in less than four minutes and weight-lifts (bench-pressing) of close to 600 pounds. Wheelchair road racers are completing marathons (26 miles, 365 yards) in well under two hours.

Competition with air pistols and air rifles will be added in 1983, and fencing in 1984.

The NWAA now has a program for junior wheelchair athletes, which includes free membership for those under 16 years of age.

*See Appendix

FOR MORE INFORMATION:

National Wheelchair Athletic Association
Templeton Gap Medical Arts Center
2107 Templeton Gap Road, Suite C
Colorado Springs, Colorado 80907

National Wheelchair Basketball Association
110 Seaton Building
University of Kentucky
Lexington, Kentucky 40506

SPORTS FOR THE CEREBRAL PALSIED

Craig Huber, M.A.

The National Association of Sports for Cerebral Palsy, a program of the United Cerebral Palsy Foundation, was started in 1978 as an effort to provide competitive sports opportunities for individuals with cerebral palsy and other neuromuscular conditions who don't fit well into the classification systems of other organizations.

The first national games were held in 1978, with 100 athletes. The 1983 games, to be held in Texas this spring, are expected to host 600 athletes.

The classification system* is functional, with eight classes, four wheelchair and four ambulatory. The classification may be split for those having different functional abilities in different sports (e.g., sports requiring either upper limb or lower limb use primarily).

Competition is offered in archery, bowling, cycling, horseback riding, track and field, weight-lifting, and both wheelchair and ambulatory soccer. Local and regional meets are held throughout the country, with national games every two years and international games in alternate (even-numbered) years. The United States team has progressed rapidly, and in the 1982 games won the team trophy for the most medals, against strong teams from Great Britian, Holland, Denmark, and others.

*See Appendix

FOR MORE INFORMATION: National Association of Sports for Cerebral Palsy
66 East 34th Street
New York, New York 10016

TENNIS AND OTHER RACQUET SPORTS

Brad Parks

Playing tennis in a wheelchair is possible! The National Foundation of Wheelchair Tennis was formed in 1980, with rules the same as those of the U.S. Tennis Association (USTA), with only one modification: two bounces are allowed. Players can use a regular wheelchair; removal of the arms will be helpful. As players advance, they will appreciate the quickness and maneuverability of a low-backed, lightweight, "sports" wheelchair.

No classification system has been necessary; players are ranked according to ability, in the same system used by the USTA: D division for beginners to A division for top-ranked players. There is a women's division, with D and open rankings. There is also a newly-developed quadriplegic division. Most quadriplegics use a mitt or bandage to hold the racquet. The National Foundation of Wheelchair Tennis is developing a junior division.

FOR MORE INFORMATION: National Foundation of Wheelchair Tennis
3857 Birch Street, #411
Newport Beach, California 92660

PREPARATION FOR PARTICIPATION IN WINTER SPORTS

Carol Page, R.P.T.

A complete current assessment of the handicapped child must be obtained prior to induction into any winter sports program. Coaches and instructors must be aware not only of physical limitations, such as reduced range of joint motion, but associated medical conditions such as diabetes, seizure disorders, and medications. Children with neuromuscular disorders with insensate skin and sphincter incontinence pose special hazards in high altitude winter conditions.

Assessment of these items can be valuable in establishing realistic goals for participation, in determining a proper conditioning program, and also in choosing the adaptations needed. Reassessment is very important to note any changes during the years, especially when you are reinforcing abnormal patterns during participation. Reassessment will reveal any difference in the physical ability. A good assessment will identify many of the problems that may exist. Many times the children are not aware of the risks, so the adult has the ultimate responsibility for being aware of the total child and his needs.

Conditioning is a particular part of our ski program. All participants are given an exercise program to do at home, and the once-a-month check-in encourages them to do this. Good flexibility and strength are extremely important factors in reducing the possibility of injury. We also try to include activities to increase endurance, balance, and coordination.

Special training for instructors is very important. The individual instructor is responsible for the safety of his students, and he must have knowledge of the handicapping condition and its implications. With all of these factors in mind, creativity by adapting and improvising equipment and teaching techniques to meet the child's needs will be a very important key to a positive experience for the instructor and the child. Another important area is safe and reliable equipment. One must also consider how adaptations may affect the safety mechanism provided by the equipment.

With the beginning program, it is helpful to begin with children with relatively high functional performance levels and to limit the number of such children until the staff gains proper experience and confidence. Ideally, the student/instructor ratio should one to one until children gain independent skiing skills. Profoundly involved children and those with special disability, such as blindness, absolutely require individualized instruction.

FOR MORE INFORMATION:

Handicap Sports Program
The Children's Hospital
1056 East 19th Avenue
Denver, Colorado 80218

WINTER SPORTS

Duane Messner, M.D.

The handicapped skiers program began in 1968 at Araphoe Basin, Colorado, with childhood amputees.* Balance for the unilateral lower limb amputee is attained by a "three-tracking" technique whereby outriggers are applied to the tips of the ski poles. We initially encouraged such people not to ski with their prostheses, but we have learned that was probably a mistake. If the child has a fairly good knee joint, his functional performance with a prosthesis is better, allowing him greater control and greater speed. Some patients enhance knee stability with external knee braces. The upper limb amputee can ski with or without a prosthesis. Skilled orthotists can easily adapt ski poles to above-elbow amputation prostheses. Most amputee skiers can safely begin skiing by age 6 or 7, and many advance to competitive levels.

Following success with the childhood amputees, the program has been expanded to include children with cerebral palsy, spina bifida, and blindness. Even wheelchair people have become involved with skiing and hockey by utilizing a sledge. Extending winter sports to the multiply handicapped child presents unique problems in balance for which one must utilize individual coaching and many adaptive equipment techniques.

Accurate physical assessment and physical conditioning are mandatory for a successful winter sports program. With individual instruction and competent supervision, the rewards in functional improvement and improvement of body image and self-esteem can be remarkable in the multiply handicapped child. With success in the local program, amputee skiers have competed in international meets for the past eight years, and selected children with neuromuscular disorders have entered international ski competition in the past four years.

*See "Winter Sports Programs", Hal O'Leary

REFERENCE: Krag, M.H., and Messner, D.G.: Skiing by the physically handicapped. Clin. Sports Med., 1(2):319, 1982.

FOR MORE INFORMATION:

Handicap Sports Program
The Children's Hospital
1056 East 19th Avenue
Denver, Colorado 80218

AQUATIC SPORTS

Louise Priest

There are four principles of an adaptive swimming program for the handicapped child. The instructor is obligated to teach the student: to enter and exit the water safely, to breathe, to propel himself independently, and to be able to recover his balance in a safe fashion. Numerous adaptations may be necessary in adaptive aquatic programs. Ideal water temperature is between 82 and 96 degrees. Children with cerebral palsy do not respond well in a cold environment. Pool adaptations may consist of removable ramps, stairs and rails. Some sophisticated pools have been provided with individually operated bottoms which can be raised or lowered to provide adjustable water depths. Mats at the pool edge are valuable to avoid abrasion to insensate skin during exit and entry.

The range of adaptive equipment for the handicapped swimmer is extensive. Personal flotation devices may be essential to provide buoyancy to children with neuromuscular disorders. The DanMar Company of Ann Arbor, Michigan, provides a full line of standard flotation devices and will custom fashion devices to special order. "Schwimmer fluegen," which are inflatable arm bands, are very beneficial for active buoyancy. Small holding devices, inflatable boats, and modified hooks are often useful to provide a point of reference in an otherwise large body of water to retarded or autistic children. The American Red Cross Adaptive Aquatics Manual is an excellent reference source for adaptive aquatic children's games.

Children with neuromuscular disability pose unique challenges for swimming instructors. Conventional techniques of instruction must be broken down into simple patterns and modified to fit the individual child. For example, a hemiplegic youngster with loss of shoulder abduction may be taught a functional propulsion technique using alternate flexion and extension of the wrist and elbow, keeping the limb at his side. Children with low levels of quadriplegia may be taught swimming techniques with the aid of proper flotation devices. Such children with altered thermoregulatory mechanisms must, however, be closely monitored for possible chilling.

Aquatics provide an important therapeutic modality to improve the mobility, confidence, and body image for the handicapped child.

FOR MORE INFORMATION: Council for Cooperation in Aquatics
National Headquarters
P.O. Box 4724
Evansville, Indiana 47711

HORSEBACK RIDING

Lida McCowan

Riding for the handicapped received international attention in 1952 when Liz Hartel, with weakness caused by poliomyelitis, won the Silver Medal for dressage at the Olympic Games in Helsinki, Finland. Formal programs for recreational therapy were established the following year in England, and in 1969 in the United States with establishment of the North American Riding for the Handicapped Association. Currently there are 220 nationwide programs listed, of which 70 are approved as having certified riding instructors. Instructor certification is mandatory in England; however, Massachusetts is the only state currently requiring certification.

Riding is an excellent adjunct to physical therapy for the handicapped child, developing self-awareness, self-confidence, and self-discipline. Riding also strengthens and relaxes muscles, improves posture, balance and coordination, while increasing joint mobility.

It must be recognized that, for all of its benefits, riding is a potentially high-risk form of recreational therapy. Such programs should provide the following safety features.

Children referred for recreational therapy riding must have medical referral with documented medical diagnoses, including medications, precautions, and associated conditions such as seizure disorders. Protective headgear should be used at all times. Certified riding instructors should be used, since riding is uniformly recognized as the greatest risk sport generally available to the handicapped. Children should not at any time ever be strapped to the saddle. Realistic therapeutic goals must be established for each rider. Children with neuromuscular disorders, including congenital and acquired paraplegia, can benefit from riding programs; however, the paralytic level T-5 is the absolute upper level for which such therapy is indicated. Children with spina bifida have participated successfully in riding programs without skin problems by the use of special cushioning of saddle pressure areas. Safety stirrups should be used to insure release of the rider in case of a fall. Thoroughly trained instructors, able to communicate in a normal manner with riders at their level of understanding, are the essential element of a successful riding program.

Riding therapy may range from driving, in which wheelchair dependent children in a wheeled cart may drive horses with driver supervision, to advanced total horse care, including grooming and feeding for appropriate youngsters. In conclusion, horseback riding can open entirely new vistas to the wheelchair dependent child. The psychologic impact is profound in children now able to look down at their contemporaries from the back of a live animal with whom they can explore their environment in a more independent manner.

REFERENCES: Bauer, Joseph J.: Riding for Rehabilitation.
Available through Canadian Stage Arts Publications, Ltd.
Toronto, Canada

McCowan, Lida: It Is Ability That Counts
Available through Cheff Center for the Handicapped
P.O. Box 171
Augusta, Michigan 49012

OUTDOOR RECREATION AND HOLISTIC HEALTH

Howard Cohen, M.T.R.

The Vinland National Center, modeled after the Beitostolen Health Sports Center in Norway, was established in Loretto, Minnesota, with a Bicentennial gift of $200,000 from Norway in 1976. The center provides to disabled persons an intensive health sports training program which is individually suited to each person's needs. The program includes physical fitness, sports/recreation training, health promotion, life enhancement, basic and applied research, professional education, and national outreach. Through such programs, disabled persons are able to improve physical, social, and emotional fitness, develop medical self-care skills, enhance self-reliance, employability and improved use of leisure time.

Outdoor recreation programs cover a wide spectrum of activities, such as nature interpretation for the blind to an integrated program for the handicapped in the Minnesota Outward Bound. The long-range goal of the health sports program is to provide the disabled with meaningful life-long sports.

It has been widely recognized that water and snow can be great equalizers for the handicapped. Recent advances in recreational sports have included kayaking, rafting, hand cycling, chair poling, and ice sledding. Specially constructed "sledges" allow paraplegic individuals to participate in sledge hockey. Each of these recreational pursuits is easily adaptable to people with spinal cord injury.

FOR MORE INFORMATION: The Vinland National Center
3675 Ihduhapi Road
Loretto, Minnesota 55384

II. STATE-OF-THE-ART

C. Specific Adaptive Techniques

1. Prosthetic Adaptations
   Vance Meadows, Certified Prosthetist

2. Technology and Recreational Mobility
   Peter W. Axelson, M.S., M.E.

PROSTHETIC ADAPTATIONS

Vance Meadows

There are a variety of prosthetic adaptations for sport; some are manufactured, some invented by the wearer, and some custom-made by a prosthetist.

A pylon attached to the lower limb stump socket is useful in skiing or swimming. The swimming pylon can be made of Aqualite (U.S. Manufacturing Company) and is lightweight and water resistant. It can be used for fishing, boating, or other aquatic sports. A detachable pylon for skiing may be made using a second casting of the socket which is then fitted with a flange obtained from a hardware store. For skiing, a pylon may be attached to a bucket-type prosthesis and attached to a ski boot with the child skiing "three-track" with forearm outriggers.

Upper limb prostheses are most easily modified by exchanging the hook for a screw-in device. There is an accessory available for bowling which inserts into the ball and is released by the same action as used in opening the hook. A baseball glove attachment is a simple two-prong mechanism that allows wearing of a first baseman's mitt type of glove.

A modification for archery involves using a bar-type upper limb prosthesis with fixed wrist which is connected directly to the bow. Trial and error are necessary to get the best angle for setting the wrist.

REFERENCES: Shearer, J.D., Buckner, M.L., Bowker, J.H.: Prostheses and Assistive Devices for Special Activities (Upper Limb). In American Academy of Orthopaedic Surgeons: Atlas of Limb Prosthetics, C.V. Mosby, St. Louis, 1981, pp. 210-218.

Kegel, Bernice: Prostheses and Assistive Devices for Special Activities (Lower Limb). In American Academy of Orthopaedic Surgeons: Atlas of Limb Prostheses, C.V. Mosby, St. Louis, 1981, pp. 423-434.

TECHNOLOGY AND RECREATIONAL MOBILITY

Peter Axelson, M.S., M.E.

Wheelchair research is being done at several places, including the Rehabilitation Engineering Center at the University of Virginia. One problem with wheelchairs is caster flutter, or "shopping cart syndrome." Two wheels mounted side-by-side on a common axle do not flutter. A new successful design is a caster wheel with a groove in the middle of the tread which has the same effect as the double wheel.

A narrow, lightweight wheelchair has been designed to fit in the aisle of an airplane. One is carried on each 767 aircraft. An effective tiedown system for wheelchairs in transport vehicles is being explored because the wheel tends to explode in accidents, sending spokes in all directions like a porcupine.

Treadmill testing is being used to produce more durable chairs and to test tires. Pneumatic tires roll with less resistance than solid tires.

Propulsion systems are the subject of investigation. Lever drive mechanisms can produce 30 to 50 percent more power as measured by wheelchair ergometers. Stair climbing mechanisms are not practical because of their bulk. Chain drive connection can provide four-wheel-drive in a design with caster wheels fore and aft in a "balanced" arrangement.

Special designs for mobility indoors in limited space include side rolling casters and an omnidirectional chair from Texas which has "wheels" arranged as a series of rollers.

There are adaptations for sport such as a bolt-on handdrive mechanism to convert to a tricycle for cycling. Another design allows the track athlete to turn his chair by leaning against a pad on either side. The pad is connected by cable to the caster which steers the chair around curves.

Poling with ski poles tipped with carbide can generate speeds as fast as roller skating. Special wide tires with tractor treads allow mountain climbing, while balloon tires allow beach travel and buoyancy in the water.

For children, there are a variety of ground scooters where the wheels are mounted on the sides of a low seat that allows them to play on the ground.

One design goal is to develop equipment that allows competition with able-bodied people. There is a two-wheel, hand-powered bicycle design from Stanford which behaves like an ordinary bicycle in terms of leaning and balance. The design won the human-powered competition, setting a record of 26 miles per hour.

Sleds for snow racing and skiing competition are popular. The Arroya sled has four steel blades arranged front and back in two tracks beneath the sled. The seat cushion is molded and the knees are kept slightly flexed to avoid effusion from prolonged hyperextension. The sled is chair-lift compatable. Most ski areas require the sled to be

(Cont'd.)

tethered to a skier following with a strap connected to the back of the sled. Precautions include close monitoring of the cross-body strap which must be as snug as a ski boot, and using extra clothing and gloves because the rider gets wet quickly due to being close to the snow.

An all-terrain vehicle with eight-wheel drive is a good device for providing outdoor access in uneven terrain for a wheelchair user. The seating must be modified to accomodate the rough ride and shear forces for the person with a spinal cord injury.

REFERENCES:

Arroya Downhill Skiing System for Persons of Disabilities (videotape)
Beneficial Designs, Inc.
5858 Empire Grade
Santa Cruz, California 95060

Rehabilitation Engineering Center
University of Virginia
Charlottesville, Virginia

II. STATE-OF-THE-ART

D. Injuries in Wheelchair Athletes

Kathleen A. Curtis, M.A., R.P.T.

INJURIES IN WHEELCHAIR ATHLETES

Kathleen A. Curtis, M.A., R.P.T.

Wheelchair athletics have changed considerably in the last several years, from competition in older hospital-type wheelchairs to use of new sports chairs and a higher level of competitiveness, producing 100 meter dashes in just over 15 seconds and marathons in less than two hours.

There are only two papers available in the literature concerned with injuries to wheelchair athletes. Jackson reported 184 athletes treated for injuries at the 1976 Olympiad for the Disabled, mostly soft tissue injuries. Corcoran summarized the potential risks for marathon participants. Both reported primarily shoulder strains, finger abrasions and lacerations, blisters, calluses, and hyper- and hypothermia.

For this study, a questionnaire was published in the magazine "Sports n'Spokes" and distributed at regional and national wheelchair competitions. One hundred and twenty-eight responses were received, from 101 male and 27 female athletes. The mean age was 29, and the average number of years since onset of the disability was 14. Disability was spinal cord injury in 65 percent, poliomyelitis in 13 percent, "congenital" in 9 percent, amputation (acquired) in 3 percent, and other (most orthopaedic disorders) in 10 percent. National Wheelchair Association of America classification level was I (quadriplegic) in 25 percent, and II, III, or IV (paraplegic or comparable disability) in 75 percent. Athletes participated most often in track, basketball, swimming, field events, and road racing.

Sixty-nine percent of respondents used protective gear of some type: gloves, taping of fingers, and occasionally helmets. Most trained between six and ten hours per week, with a range of one to twenty-five hours.

Seventy-two percent of the respondents reported injuries; the total number of injuries reported was 291. Twenty percent occurred in track activities, 24 percent in basketball, and 22 percent in road racing (off a racing track, in community races). An additional 6 percent occurred in tennis, 4 percent in field events, 4 percent in swimming, and less than 2 percent each in other sports.

The most common injuries, as reported by athletes, were soft tissue injuries: muscle strains and pulls, tendonitis, bursitis, etc. These accounted for 33 percent of the reported injuries. The remainder were blisters (18 percent), lacerations or abrasions (17 percent), pressure sores (7 percent), and joint disorders (5 percent).

There was no relationship between sex or classification level and injury incidence. There was an increased number of injuries for athletes involved in more than nine sports. Athletes between the ages of 21 and 30 years were at highest risk for injury, as were those training more than 10 hours per week.

Particular problems in specific athletes included hyperthermia and hypothermia in quadriplegics (competing and waiting in hot sun and cold pools), and carpal tunnel syndrome in racing athletes. All athletes over 40 years of age reported shoulder and elbow over-use problems.

(Cont'd.)

Injuries in wheelchair athletes, Curtis (cont'd.)

Recommendations for injury prevention include stretching, warm-up and cool-down exercises, slow progression of conditioning program, preventive care of old injuries (rehabilitation of muscle strength, taping, etc.), use of protective gear, including gloves. Skin care involves close inspection, promotion of callus formation and care of calluses by filing, prevention of cracking by lotions (but avoidance of over-softening), and taping of thumb and fingers protectively. Hazardous parts of the wheelchair should be removed or padded (brakes, armrest sockets, etc.). The use of canted wheels on basketball chairs (top of wheel angled in) prevents catching fingers between hand rims when wheels touch. Pressure sore prevention involves proper padding, relief of sacral and ischial areas by chair or cushion design, good hygiene, absorbent clothing, proper nutrition, and frequent weight relief by push-ups.

One problem for some athletes is their return to rehabilitation settings for their medical care, when the goal of the medical treatment may not be return to competition, but acceptance of a lesser "functional" outcome for everyday activities. Athletes need to seek out approrpiate "sports medicine" oriented care.

An on-going wheelchair sports injury registry is suggested.

REFERENCES:

Corcoran, P.J., et al.: Sports medicine and the physiology of wheelchair marathon racing. Orthop. Clin. North Amer.,11(4):697-716. 1980.

Jackson, R.W., and Fredrickson, A.: Sports for the physically disabled: The 1976 Olympiad (Toronto). Amer. J. Sports Med., 7:293-296, 1979.

II. STATE-OF-THE-ART

E. Making It Available

1. Community Programs
   Janet Pomeroy
   Connie Lewis, R.P.T.

2. Camp Programs
   Gary Robb, M.T.R.
   Brad Parks

3. Winter Sports Programs
   Hal O'Leary

4. United States Olympic Committee: Its Involvement
   Andy Fleming, Craig Huber, M.A., and
   Duane Messner, M.D.

BUILDING A COMMUNITY PROGRAM

Janet Pomeroy

Persons with disabilities are no longer commonly sequestered in institutions. Their needs, including the need for recreation, are now often the responsibility of their communities. The Recreation Center for the Handicapped, Inc., in San Francisco, California, has demonstrated that programming for persons with disabilities is limited only by the imagination of the recreation providers.

There are four barriers: 1) attitudes, 2) architecture, 3) transportation, and 4) budget. The Recreation Center has been overcoming these barriers for thirty years.

Attitudes have been changed by: 1) constant exposure of the community to the disabled, and vice versa; 2) education and advocacy; 3) political involvement; and 4) the news media.

Architectural barriers can be overcome by creativity. The building used for twenty years was originally built as a restaurant. The new building is specifically designed for use by the disabled.

Transportation must be provided by the community recreation program to assure access for all participants. The Center quickly moved from taxi cabs to the use of specially equipped buses. These have been donated by various community groups and are identified with the donor's name, as well as the emblem and name of the Center.

Budget restrictions have been overcome by obtaining funds from a variety of sources. Early funding (12 years) was by personal solicitation from individuals, service clubs, fraternal organizations, letter appeals, parent and club groups. Subsequently, contracts were obtained from the Department of Parks and Recreation for special programs. Private resources provide 40 percent of funding, especially from foundations, which requires "grantsmanship" to write proposals and reports. Other private funds are contributed by organizations who raise money through "event" type activities such as suppers, carnivals, and dances. Wills and bequests have been valuable sources. Corporations are becoming more aware of helping non-profit corporations within their communities, and are developing community involvement teams who are especially interested in sponsoring specific projects such as replacing the floor in the multipurpose room. "Marketing" appears to be the key to future survival. One approach is to write a proposal for adopting and supporting a specific program for about $20,000 per year; for example, pre-school programs for severely disabled children. Other options for "purchase" by a charitable group would be providing a bus for a year or furnishing an activity room or gymnasium.

FOR MORE INFORMATION: The Recreation Center for the Handicapped, Inc.
207 Skyline Boulevard
San Francisco, California 94132

COLORADO OUTDOOR EDUCATION CENTER FOR THE HANDICAPPED

Connie Lewis, R.P.T.

This is a community-based, private program established in 1976 in Breckenridge, Colorado. It is a cross between Outward Bound, Bradford Woods, and Vinland Center, taking the best elements from each program. The program offers camp-type sports, games and activities for the disabled, including dog sledding in the winter. They accept people referred by a variety of agencies for skill acquisition or other goals, including therapeutic recreation. Children with a variety of problems, including orthopaedic disabilities, psychological problems, and cancer have benefited.

FOR MORE INFORMATION: Colorado Outdoor Education Center
for the Handicapped
P.O. Box 697
Breckenridge, Colorado 80424

CAMP PROGRAMS

Gary Robb, M.T.R.

At this time, there approximately 250 residential camps for handicapped children in the United States. In addition, there are many more day camps, although most of these are established with specialty interests.

Some camps have tried to integrate the handicapped with regular programs, following the mainstreaming mandate of Federal Law 94-142 and 504. However, many parents opposed the mainstreaming concept, preferring camp programs which specialize in activities for handicapped children.

Bradford Woods is a University of Indiana facility on 2,300 acres set aside for outdoor living, education and camping. An Individual Educational Plan (I.E.P.) is written for each child. A six-step program has been developed which begins with an "Adventure Sequence" to increase the child's awareness of the environment. The second step is to introduce the child to group cooperative activities. After the child has succeeded at individual initiatives, group initiatives are encouraged. Finally, the child is introduced to low-level, and later high-level, adventure experiences. These programs are introduced to the handicapped child during the course of a two-week summer resident camp for the disabled.

Most camps provide a variety of opportunities for the disabled child, including creative arts and crafts, aquatic skills, theater opportunities, horseback riding skills, and other outdoor camping skills.

REFERENCE: The Bradford Papers: Proceedings of the Third Annual Institute on Innovations in Camping and Outdoor Education With Persons Who Are Disabled, 1983.

Available through: Bradford Woods
5040 State Road 67 North
Martinsville, Indiana 46151

A JUNIOR WHEELCHAIR SPORTS CAMP

Brad Parks

The National Wheelchair Tennis Foundation sponsors a daycamp for children aged 7 to 18 years, who either use a wheelchair or could benefit from its use to participate in sports. The staff and counselors are disabled athletes and, in addition, there are 200 able-bodied volunteers. Transportation and lunches are provided, and the camp is free, participation being subsidized by donations. Sports offered are basketball, tennis, track and field, swimming, weight training, and exercise programs.

Preliminary exhibition clinics were held at local schools, recruiting participants and introducing wheelchair sports to children and teachers. The counselors serve as positive role models for children with disabilities, and the camp allows them to make friends with others with the same disabilities.

The introduction of the sports-model wheelchair is a very positive effect of the camp, as these lightweight, functional, and esthetically pleasing chairs help to enhance the image of the children using them and break down barriers between disabled and able-bodied children.

FOR MORE INFORMATION: Mission Viejo Wheelchair Sports Camp
3857 Birch Street, #411
Newport Beach, California 92660

WINTER SPORTS PROGRAM DEVELOPMENT

Hal O'Leary

The winter sports program at Winter Park Ski Area in Colorado began in 1970 with 23 amputee children from The Children's Hospital in Denver. The program has expanded each year, adding new types of handicaps; the second year mentally retarded and blind, and subsequently cerebral palsy, spina bifida, and addiction problems were added. Integration with the "beautiful people" at a ski resort was slow, but successful with exposure. Teaching the volunteer instructors about various disabilities was a challenge, as each person learned a specific disability and how to teach a person so affected. Initially all the money was provided by Winter Park, but now the program requires only 25 percent subsidy and teaches 12,000 lessons per year using 550 volunteers and 18 full-time instructors.

Adaptive equipment, such as outriggers, as well as skis, boots, and poles, are provided by the program with many donations from manufacturers. Transportation is provided by the sponsoring organizations, such as The Children's Hospital, for the amputee and neurologically handicapped children.

Having worked with a broad variety of disabilities, the policy has developed that anyone who can walk or wheel in can be helped. The natural extension has been to a year-round program with summer mountain sports, such as sailing, rafting, and hiking. Future plans are for Zephyr Village near Winter Park where people with handicaps and their families can be housed for vacations and recreation.

FOR MORE INFORMATION: Winter Park Handicapped Skier Program
Winter Park Recreational Association
P.O. Box 36
Winter Park, Colorado 80482

UNITED STATES OLYMPIC COMMITTEE: ITS INVOLVEMENT

Andy Fleming, Craig Huber, M.A., and Duane Messner, M.D.

The United States Olympic Committee (USOC) has a subcommittee on the disabled, now known as the Disabled in Sports Committee (DISC). Its members represent the six following national organizations which are Group E members of the USOC: The National Association of Sports for Cerebral Palsy, The National Wheelchair Athletic Association, The United States Association for Blind Athletes, Special Olympics, The American Athletic Association of the Deaf, and The United States Amputee Athletic Association.

In 1984, the Disabled Olympics will be held in the United States in two venues: The Seventh World Wheelchair Games at the University of Illinois, for spinal cord injured athletes, and The 1984 International Games for the Disabled in Nassau County, New York, for blind, amputee, cerebral palsy, and "les autres" (other) athletes.

The DISC has as a portion of its mandate the responsibility to encourage and support amateur athletic sports programs for handicapped individuals, including, where feasible, the expansion of opportunities for meaningful participation by such individuals in programs of athletic competition for able-bodied individuals.

FOR MORE INFORMATION:

Brig. General Robert M. Montague, Chairman
Disabled in Sports Committee
Special Olympics
1701 K. Street
Washington, DC 20006

III. ATHLETE PROFILE AND CHECKLIST

We have developed the following outline to help you assess the child or young adult with a physical disability who might participate in recreational and sport activities. We have listed five major categories of disability to simplify considerations of participation. Patients with other disabilities may be able to be considered in one of these major groups or they may need individual consideration.

Assessment should begin with the usual history and physical format. We will emphasize certain points which should be considered with respect to sports activity. The particular sports themselves are considered in the following section, and a "participation possibility chart" shows recommendations regarding particular sports and particular disability groups.

Many of these patients will present special challenges to the providers of activities; it is important that you send as much pertinent information as possible about your patient's abilities, and also particular precautions to be considered.

Reassessment should be done at least yearly, with new information sent to the program. Remember that the goal is to maximally develop the child's abilities; the disability needs to be accurately assessed and precautions indicated, but avoid needless restrictions. Most sport and recreational activities can be adapted to most patients.

FORM TO BE SENT TO RECREATIONAL PROGRAM LEADER BY PHYSICIAN

NAME _____ BIRTHDATE _____

ADDRESS _____ AGE _____

_____

PHONE _____

DIAGNOSIS _____

ETIOLOGY _____

EQUIPMENT USED (Orthotics, walking aids, etc.) _____

_____

_____

ADL (Activities of daily living) INDEPENDENCE ? Yes No

_____

_____

_____

MEDICATIONS _____

SPECIAL CONSIDERATIONS _____

_____

_____

SIGNATURE _____

ADDRESS _____

_____

PHONE _____

(See following pages for considerations concerning the use of this form.)

PATIENT HISTORY/PHYSICAL CHECKLIST

In addition to the usual medical history and physical, consider the following points:

I. Diagnosis

Etiology

II. Present Health Status

Medications
Allergies
Educational status: Special education?
Mainstreamed with resource support?
Regular school?

Current medical problems:

CSF shunt (age inserted, number of revisions, name of neurosurgeon)
Seizure disorder (controlled? medications, name of neurologist)
Diabetes (medication? self-administered? name of physician)
Heart disease
Renal disease
Other

Present sport/recreational involvement

Physical fitness status

III. Past Medical History

Date of onset of disability
Etiology

Previous involvement in sports
History of injury in sports (specify)
Current skill level (advanced, intermediate, novice)

IV. Psychological Status (have patient draw a picture of himself)

Patient's self-image (good, fair, poor)

Emotional development and stability (appropriate for chronologic age?)

Source of motivation
Intrinsic? (Does patient have personal goals for participation in sport or recreation?)

Extrinsic? (Is patient responding to outside pressures, including physician's, for participation?)

Does patient/family have realistic or excessive fear of injury?

V. Social History

Parental attitude on sports participation
Financial status
Peer relationships of patient
Family/patient awareness of school and community resources for athletic participation

VI. Functional Assessment/Physical Exam

Vision, hearing, balance and proprioception
Speech (understandable? type of non-verbal communication used?)
Appliances used (braces, prostheses)
Mobility
  Independent: No aids
  Aids used (cane, crutches, walker)
  Assistance needed for ambulation (one person, two people, standby only)
  Wheelchair (manual, power) - independent in transfers?
  Dependent
Gait pattern
Joint ROM/contractures/fixed deformity/stability
Muscle tone
Strength
Sensation
Sphincter control (bowel, bladder)
Special considerations
  Risk of fracture
  Risk of hemorrhage
  Seizure disorder
  Other

VII. Special Considerations for Diagnostic Categories

Amputees

  Level
  Skin problems
  Bony overgrowth problems
  Sports participation before and after amputation
  Participation with and without prosthesis
  Name of prosthetist
  Type of prosthesis
  Alternate terminal devices, etc.
  Hydraulic knee

Cerebral palsy patients

  Diagnostic type (spastic, athetoid, ataxic, rigid, hypotonic)
  Pattern (hemiparetic, diparetic (diplegic), quadriparetic (quadriplegic), other)
  Upper extremity fine and gross motor function
  Lower extremity orthotics

Spinal cord disruption (spinal cord injury or myelodysplasia)

  Complete or incomplete
  Motor level and symmetry
  Sensory level and symmetry
  Spastic or flaccid below level of lesion
  Review of systems: respiratory, GU, GI problems
    Nutritional status
    Autonomic dysreflexia problems
    Neurologic progression
    Spine stability

Patient history/physical checklist (Cont'd.)

Other Neuromuscular Disorders

- Static or progressive
- Rate of progression

Other Problems

- Osteogenesis imperfecta: congenita or tarda
  - Most recent fractures
  - Frequency of fractures currently
  - Orthotics
- Juvenile rheumatoid arthritis
  - Mono-, pauci-, or poly-articular
  - Visual problems
  - Cervical spine instability
  - Orthotics
- Down's syndrome
  - Cervical instability

IV. SPORTS CHECKLIST

Almost all sports can be adapted for persons with physical disabilities. This may be a minor modification of the rules (two bounces for wheelchair tennis), adapted equipment (three-track skiing), or more complex adaptations (classification systems allowing equitable competition).

Consider the following points (summarized below in a checklist) when assessing a patient and a sport:

Is the patient interested? Are there emotional or motivational factors involved? Are there specific therapeutic benefits for a particular patient from a particular sport? Will the goals be recreation, socialization, self-improvement, or the opportunity to excel or win in competition? Is individual or team participation desirable?

What are the physical demands of the various sports, and the patient's ability to meet them? What are the patient's skill levels? Are programs with well-trained instructors available in the area?* Will expensive equipment be necessary, or perhaps provided by programs; and might the expense be worthwhile, compared to the benefits and to other patient-related expenses? Is the sport a high-risk one? Such sports often have specific benefits for the patient, but well-run programs with experienced instructors and emphasis on skills, equipment, and safety are essential.

We have developed a "participation possibility chart" which includes the major physical disabilities and major sporting activities. The activities are noted as Recommended, Individualized, Adapted, or Not Recommended, or no notation is made if insufficient information is currently available. Most of these activities are recommended for most of these categories of disability.

"Individualized" means that, while the activity may be clearly inappropriate for some people with certain disabilities, it may well be possible for others in the same category, and we do not feel it is contra-indicated for all. The physician's judgement and knowledge of the patient are necessary. "Adapted" means that in almost all cases adaptations of equipment or rules will be necessary. "Not recommended" means that there was agreement among the participants in the seminar that participation by that particular group of people in that particular sport is inappropriate and dangerous, and without redeeming benefits.

THE CHECKLIST

- Patient interest
- Emotional or motivational factors
- Therapeutic benefits
- Goals: recreation, socialization, self-improvement, competition
- Physical demands
- Patient's skill level
- Available programs
- Cost/benefit ratio
- Risk/benefit ratio

*See "Resources" in Appendix

PARTICIPATION POSSIBILITY CHART

	Individual Sports																								Team Sports										
	Archery	Bicycling	Tricycling	Bowling	Canoeing/kayaking	Diving	Fencing	Field events*	Fishing	Golf	Horseback riding	Rifle shooting	Sailing	Scuba diving	Skating (roller & ice)	Skiing (downhill)	Skiing (cross-country)	Swimming	Table tennis	Tennis	Tennis (wheelchair)	Track	Track (wheelchair)	Weight lifting	Wheelchair poling	Baseball	Softball	Basketball	Basketball (Wheelchair)	Football (tackle)	Football (touch)	Football (wheelchair)	Ice hockey	Sledge hockey	Soccer	Soccer (wheelchair)	Volleyball
AMPUTATIONS																																			
Upper Extremity	RA	R	R	R	RA	R	R	R	R	RA	R	RA	R	R	R	R	R	R	R	R		R		R		R	R	R		R	R		R		R	R
Lower Extremity (AK)	R	R	R	R	R	R	I	R	R	R	R	R	R	R	I	RA	RA	R	R	I	R		R	R	R		RA	RA		R	I	I	R		R	I	R	R
Lower Extremity (BK)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	I	R	I	R	I		R	R	R	I	R	R	I	I	R	I	R
CEREBRAL PALSY																																			
Ambulatory	R	R	R	R	R	R	I	R	R	R	R	R	R	I	R	RA	RA	R	R	R		R		R		R	R	I		I	I		I		R		R
Wheelchair	R	I	I	R	R	I	I	I	R	I	I	R	R					I	R		R		R	R	R	I	I		R			R		I		R	I
SPINAL CORD DISRUPTION																																			
Cervical	RA		RA	RA	IA			I	R		X	RA	R			IA	IA	R	RA		IA		R		I				I			I		I			IA
High-thoracic (T1-T5)	R		R	R	R		RA	R	R	RA	I	R	R	R		IA	IA	R	R		R		R	R	R	RA	RA		R			R		R		R	RA
Low thoracolumbar (T6-L3)	R		R	R	R		RA	R	R	RA	R	R	R	R		RA	RA	R	R		R		R	R	R	RA	RA		R			R		R		R	RA
Lumbosacral (L4-sacral)	R	R	R	R	R	R	R	R	R	R	R	R	R	I	R	R	R	R	R	R		R		R		R	R	R	I	I	R	I	I		R		R
NEUROMUSCULAR DISORDERS																																			
Muscular dystrophy	RA	I	R	R	I	I		R	R	R	I	RA	R	I	I	I	I	R	R	I	I	I	I		R	I	I	I	I			I	I	I	I	I	I
Spinal muscular atrophy	RA	I	R	R	I	I		R	R	R	I	RA	R	I	I	I	I	R	R	I	I	I	I		R	I	I	I	I			I	I	I	I	I	I
Charcot-Marie-Tooth	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		R		R		R	R	R		R	R		I		R		R
Ataxias	R	I	I	R	I	I		R	R	I	I	R	R	I	I	I	R	R	R	R	R	I	R	I	R	I	I	I	R		I	I	I	I	I	R	I
OTHERS																																			
Osteogenesis imperfecta	R	I	R	R	R	I	R	R	R	I	I	R	R	I	I	I	R	R	R	R	R	R	R	I	R	I	I	I	R	X	I	I	X	X	X	R	I
Arthrogryposis	R	I	I	R	R	I	I	R	R	I	R	R	R	I	I	I	R	R	R	R		R		I		R	R	R		X	R	I	I		I		R
Juvenile rheumatoid arthritis	RA	I	I	RA	R	I	I	I	R	I	I	R	R	I	I	I	I	R	R	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Hemophilia	RA	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	R	R	R	I		R		I		I	R	R		X	I		X		I		R
Skeletal dysplasias	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	RA	R	R	R	R		R		I		R	R	R		I	R		R		R		R

*clubthrow, discus, javelin, shotput

R=Recommended A=Adapted

I=Individualized X=Not Recommended

Blank=No information or not applicable

(see previous page)

V. PROGRAM DEVELOPMENT

A. Statement of the Problem: The majority of individuals with disabilities do not participate in organized sports and recreation simply because programs are unavailable to them. There are three major reasons for this situation. First, the majority of programs serving the able-bodied have made no provision for the athlete with disabilities. Second, major groups serving the disabled have not yet become geographically comprehensive. Third, the general public is unaware of the potential of these programs because of a paucity of high-quality media coverage of sanctioned events.

B. Needs Assessment: Before proceeding with program development, certain facts should be ascertained. The potential number of people with disabilities should first be determined. Second, existing programs should be noted, so as to avoid duplication and unnecessary competition. In areas where large populations of disabled persons live, programs may be in existence that can be utilized as nuclei for expansion. Often such programs have been developed by the disabled themselves with minimal assistance from the general public. Existing sports programs for the non-handicapped should also be identified. Their members may assist in setting up programs for the disabled, either inside or outside their organization. After identification of needs, programs should be tailored to meet them as closely as possible.

C. Potential Community Resources for Program Development

1. Sports organizations for able-bodied athletes
   a. As a source of coaches for specific sports
   b. As sponsors for handicapped teams within or outside their organization
2. Sports organizations for athletes with disabilities
   a. As a source of coaches for specific sports
   b. As parent groups which will sponsor juvenile groups and incorporate individuals as they mature
3. City and county recreation departments
4. Education units
   a. Board of Education
   b. Parent-teacher association
   c. School coaches
   d. Use of gymnasium after school hours
   e. College physical education students
5. Parents
   a. Referral of their children
   b. As advocates for programs

(Cont'd.)

Program development (Cont'd.)

6. Medical community
   a. Physicians
   b. Physical and occupational therapists
   c. Therapeutic recreation specialists
   d. Social workers
   e. Psychologists
   f. Nurses
   g. Above to serve on Medical Advisory Committee

7. Hospitals
   a. Development of inpatient program
   b. Sponsorship of outreach program

8. National organizations serving the disabled
   (e.g. United Cerebral Palsy, Muscular Dystrophy Association, National Handicapped Sports and Recreation Association)
   a. For existing programs
   b. For expansion into your area

9. Youth-oriented groups
   a. YMCA
   b. YWCA
   c. 4-H
   d. Boys' Club
   e. Boy Scouts
   f. Girl Scouts
   g. Campfire Girls
   h. Big Brother/Big Sister

10. Service clubs and school groups
    a. Team sponsorships
    b. Fund-raising

11. Media
    a. Publicity
    b. Sponsorship of teams or groups
    c. Fund-raising (telethons)

12. Sporting goods industry (local and national)
    a. Donation of equipment
    b. Sponsorship of teams

13. Publicity resources
    a. Yellow Pages listing
    b. Media (television, radio, newspaper)
    c. Newsletters
    d. Advertising agency campaigns

(Cont'd.)

Program development (Cont'd.)

14. Finding resources
    a. Federal matching
    b. Federal pilot projects
    c. Local - private
    d. Local organizations
    e. Local government
    f. Foundation matching
    g. Foundation pilot program

D. Elements of Program Development

1. Personnel
    a. Volunteer
    b. Paid

2. Facilities
    a. Donated
    b. Leased
    c. Owned

3. Equipment
    a. Donated
    b. Purchased
    c. Capital vs expendable

4. Transportation

5. Political support system
    a. Local - parks and recreation
    b. State
    c. National

VI. COMMUNICATION

A. Statement of the Problem: The field of sports and recreation for the handicapped has developed to its present state due to the efforts of a multiplicity of organizations and individuals, both professional and lay. To date, there has been no central organizing body, and communication among the various organizations and individuals has largely been fortuitous, rather than planned. The Winter Park Seminar, which created this report, is one of the first attempts in North America to bring professionals in medicine and specialists in sports and recreation for the disabled together for a comprehensive discussion of common needs and goals. Further communication should involve an even larger group of organizations known to be involved in this field.

In addition, there are many individuals needing a greater awareness of the information discussed in this seminar. In the health care field, these include centers treating children with disabling conditions, physicians involved in their care, therapists, and physicians with a special interest in sports medicine. In the education field, these include classroom, special education, and physical education teachers, counselors, and administrators. The general public, at present, is either unaware of the recreational and sports activities available to the child and young adult with a physical disability, or views these activities as frivolous or potentially harmful. Information has been well-disseminated concerning sports for mentally retarded children through publicity for Special Olympics.

B. Proposed Solutions to the Problem

1. Organize similar, but expanded, meetings, preferably annually and sponsored by the American Academy of Orthopaedic Surgeons, and the United States Olympic Committee (Disabled in Sports Committee).

2. Organize regional seminars to disperse state-of-the-art information on sports and recreation for the disabled.

3. Establish a national data bank/repository/library of written and audiovisual material pertinent to this field. (May be able to use NARIC or USOC for this program.)

4. Publish articles related to this field in pertinent professional journals and intradisciplinary newsletters.

5. Present scientific exhibits and instructional courses to pertinent professional societies.

6. Contact treatment centers and schools for exchange of information.

7. Contact medical and allied health educators to encourage inclusion of pertinent information in their curricula.

(Cont'd.)

Communication (Cont'd.)

8. Produce a video tape to be composed of sports and recreational material shown at this seminar.

9. Contact television stations to produce Public Service Announcements, For Your Information segments, and coverage of athletic events involving children and young adults with disabilities.

10. Encourage newspaper coverage of disabled sports events with suggestion to report these events in the sports pages rather than as a special interest item.

Implementation of these recommendations will require diligent effort on the part of all individuals involved in the Winter Park Seminar. They will need to personally follow through to reach the target individuals and institutions.

VIII. APPENDIX

A. Bibliography

B. Annotated Bibliography of Audiovisual Resources

C. Program Resources

D. Functional Classifications

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B. ANNOTATED BIBLIOGRAPHY OF AUDIOVISUAL RESOURCES
(Reviewed at the Winter Park Seminar)

1. "Ability Not Disability" 23 minutes

Horseback riding as a program for rehabilitation at Cheff Center near Battle Creek, Michigan, is described. Children with various disabilities find pleasure and increase motor skills by riding and caring for horses. A training program for instructors is portrayed.

The Latham Foundation
Latham Plaza Building
Clement and Schiller
Alameda, California 94501

2. "The Right to Choose" 23 minutes

The use of horseback riding, including fox hunting, for rehabilitation at Stoke-Mandeville Center in England is illustrated. Example cases are primarily adults neurologically impaired following trauma.

British Horse Society
Kenilworth, England

3. "Two, Three, Fasten Your Ski" 17 minutes

Rehabilitation program for amputee skiers established by Children's Hospital, Denver, at Winter Park, Colorado, is portrayed in this film. Adaptive techniques and equipment for three-track skiing are described.

Crystal Productions
Box 12317
Aspen, Colorado 81612

4. "The Mountain Does It For Me" 12 minutes

Teaching young people with cerebral palsy to ski is the subject of this film. A conditioning program at Children's Hospital, Denver, leads to instruction in recreational skiing at Winter Park, Colorado. For some of the participants, skiing is easier than walking because "the mountain does it for me."

Crystal Productions
Box 12317
Aspen, Colorado 81612

5. "No Simple Road" 16 minutes

Activities offered children by the Handicapped Sports Program in Denver, Colorado, are presented through interviews of the children by the children. Golf, tennis, basketball, soccer, rafting, downhill and cross-country skiing for traumatic and congenital amputees are shown.

Crystal Productions
Box 12317
Aspen, Colorado 81612

(Cont'd.)

Annotated bibliography/audiovisuals (Cont'd.)

6. "Out of the Shadow" 27 minutes

Development of a recreation center near San Francisco for physically impaired children and adults is described. Pool activities, games, camping, and the arts are featured.

Recreation Center for the Handicapped
207 Skyline Boulevard
San Francisco, California 94132

7. "Splash" 20 minutes

Adaptive aquatics for developmentally delayed young children are described. Swimming techniques are modified for disabilities on an individual basis.

Documentary Films
3217 Trout Gulch Road
Aptos, California 95003

8. "Equal Victors" 25 minutes

This film features outdoor activities for the physically disabled in a pastoral setting at Vinland National Center. Horseback riding, canoeing, obstacle courses, winter sports, wheelchair basketball, and tennis are shown. An outreach program is described.

Vinland National Center
Box 308
Loretto, Minnesota 55384

9. "Body Position of Young Paraplegics in Water" 20 minutes

Swimming techniques modified for paraplegic children are shown through an underwater window. Problems such as the effect of hip flexion contracture on body position in the water are illustrated.

Institut fuer Rehab. u. Behinderiensport
DJHS Koeln Carl Diem Weg
500 Koeln 41, West Germany

10. "Classification for Wheelchair Basketball" 30 minutes

A functional classification for wheelchair basketball is illustrated. Physical requirements for passing, dribbling, rebounding, etc. are shown by participants.

Institut fuer Rehab. u. Behinderiensport
DJHS Koeln Carl Diem Weg
500 Koeln 41, West Germany

11. "Camping and Recreational Programs for the Handicapped" 20 minutes

A summer camp for physically disabled, ambulatory and non-ambulatory, children is shown. Staff training, nature programs, aquatic sports and games, and outdoor activities are illustrated.

Bradford Woods
5040 State Road, 76N
Martinsville, Indiana 46151

ADDITIONAL FILMS

"A Movie" (Olympiad for the Physically Disabled, Unit #9, 525 Rathburn Road, Etobicoke, Ontario M9C 3T2, Canada)

"And So They Move" (Audio-Visual Center, Michigan State University, East Lansing, MI 48824)

"Beginnings - A Film About Play" (Modern Talking Picture Service 2323 New Hyde Park Road, New Hyde Park, NY 11040)

"Camping Facilities for the Handicapped" (Bradford Woods, 5040 State Road, 67 North, Martinsville, IN 46151)

"Camping Programs for the Handicapped" (Bradford Woods, 5040 State Road, 67 North, Martinsville, IN 46151)

"Camp Towhee" (Mrs. Doreen Kronick, 306 Warren St., Toronto, Ont., Canada)

"Cast No Shadow" (Professional Arts, Inc., Box 8484, Universal City, CA 91608)

"Challenge: A Camp For All Seasons" (Easter Seal Society of Florida, 231 East Colonial Drive, Orlando, FL 32801)

"Changes" (Crystal Productions, Box 12317, Aspen, CO 81612)

"Consequences" (Crystal Productions, Bos 12317, Aspen, Co 81612)

"Cyphers in the Snow" (Michigan State University Film Library, East Lansing, MI 48824)

"Dream to Grown On, A" (Bone Film Service, 3132 M St., N.W., Washington, DC 20007)

"Focus On Ability" (American Red Cross General Supply Office, 17th and D Streets, N.W., Washington, DC 20006)

"Get It Together" (Pyramid Films, 2801 Colorado Avenue, Santa Monica, CA 90404)

"Heidelburg Paralympics, 1972" (National Wheelchair Athletic Association, 40-24 62nd Street, Woodside, NY 11377)

"In-Out-Up-Down-Over-Under-Upside-Down" (ACI Films, 35 West 45th Street, New York, NY 10036)

"Keep On Walking" (The National Foundation-March of Dimes, 800 Second Avenue, New York, NY 10017)

"Little Marty" (The National Foundation-March of Dimes, 800 Second Avenue, New York, NY 10017)

(cont'd.)

Additional films (Cont'd.)

"Maybe Tomorrow" (Adventures in Movement, 945 Danburg Road, Dayton, OH 45420)

"Matter of Inconvenience, A" (Stanfield House, Suite 203, 12381 Wilshire Boulevard, Los Angeles, CA 90025)

"Miracle in the Woods" (Bradford Woods, 5040 State Road, 67 North, Martinsville, IN 46151)

"Movement Exploration" (Documentary Films, 3217 Trout Gulch Road, Aptos, CA 95033)

"Movement Exploration: What Am I?" (Film Associates, 11559 Santa Monica Boulevard, Los Angeles, CA 90025)

"Outside" (Crystal Productions, Box 12317, Aspen, CO 81612)

"Proud Ones" (Montana Film Productions, 1236 Helena Avenue, Helena, MT 58601)

"Riding Toward Freedom" (Rehab Films, 20 W. 40th Street, New York, NY)

"Swimming for a Congenital Quad Amputee" (Instructional Media Center, University of Texas, University Station, Austin, TX 78712)

"Therapy Through Play" (Richard Switzer, Human Resources Center, Albertson, NY 11507)

"Time Is For Taking" (Stuart Finley, 3428 Mansfield Road, Lake Barcroft, Falls Church, VA 22041)

"To Live On" (JEG Hess Productions, Transit Media Library, P.O. Box 315, Franklin Lakes, NJ 07417)

"Wheelchair Techniques" (Institut fuer Rehab. u Behinderiensport, DSHS Koeln, Carl Deim Weg, 500 Koeln 41, West Germany)

"Wheelin' Steel" (National Wheelchair Athletic Association, 40-24 62nd Street, Woodside, NY 11377)

VIDEOTAPES

"Aetna-Wheelchair Tennis" (AudioVisual Resources, DA 02, Aetna Life and Casualty, Hartford, CT 06516)

"Arroya Downhill Skiing System for Persons of Disabilities" (Beneficial Designs, Inc., 5858 Empire Grade, Santa Cruz, CA 95060)

"Challenge, The" (Bradford Woods, 5040 State Road, 67 North, Martinsville, IN 46151)

"Fundamental of Wheelchair Basketball for Women" (National Wheelchair Basketball Association, 110 Seaton Building, University of Kentucky, Lexington, KY 40506)

"Winners, The" (Colorado Outdoor Education Center for the Handicapped, Box 697, Breckenridge, CO 80424)

C. PROGRAM RESOURCES

GENERAL AND NATIONAL PROGRAMS

American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD)
1900 Association Drive
Reston, VA 22091

American Association for the Deaf
Lantern Drive
Silver Springs, MD 20902

American Association for Health, Physical Education and Recreation
Programs for the Handicapped
1201 16th Street, NW
Washington, DC 20036

American Athletic Association of the Deaf
3916 Lantern Drive
Silver Springs, MD 20902

American Blind Bowling Association
150 N. Bellaire Avenue
Louisville, KY 40206

American Camping Association
Bradford Woods
5040 State Road 67 North
Martinsville, IN 46151

American Red Cross
17th and D Streets
Washington, DC 20006

American Wheelchair Bowling Association
2424 North Federal Hwy, Suite 109
Boyton Beach, FL 33435

American Wheelchair Bowling Association
2635 NE 19th Street
Pompano Beach, FL 35340

American Wheelchair Bowling Association
6718 Pinehurst Drive
Evansville, IN

American Wheelchair Pilots Association
3953 West Evans Drive
Phoenix, AZ 85023

Amputee Golfers Association
Lakeview Terrace
Watchung, NJ 07060

Amputee Sports Association
11705 Mercy Blvd.
Savannah, GA 31406

British Amputee Ski Association
Box 1373
Banff, Alberta TOL OCO

Campfire, Inc.
4601 Madison Avenue
Kansas City, MO 64112

Canadian Association for Disabled Skiing
Box 2077
Banff, Alberta TOL OCO

Canadian Wheelchair Sports Association
333 River Road
Ottawa, Ontario K1L 3B9

Committee for Promotion of Camping for the Handicapped
2056 S. Bluff Road
Traverse City, MI 49684

Council for National Cooperation in Aquatics
51 Clifford Avenue
Pelham, NY 10803

Disabled Sportsmen of America, Inc.
P.O. Box 26
Vinton, VA 24179

Handicapped Boaters Association
P.O. Box 1134
Ansonia Station, NY 10023

Handicapped Flyers International
1117 Rising Hill
Escondido, CA 92025

Handicapped Scuba Association
1104 El Prado
San Clemente, CA 92672

Handicapped Sportspersons Association
3738 Walnut Avenue
Carmel, CA 95608

Handicapped Unbound, Inc.
P.O. Box 1044
Prescott, AZ 86302

Inconvenienced Young Sportsmen's Association
1321 West Rosecrans Avenue
Gardenia, CA 90247

International Committee of the Silent Sports
Gallaudet College
Florida Ave. and 7th St. NE
Washington, DC 20002

International Council on Therapeutic Ice Skating
P.O. Box 13
State College, PA 16801

International Foundation of Wheelchair Tennis
1909 Alawai Blvd., Suite 1507
Honolulu, HI 96816

International Society for Rehabilitation of the Disabled (Rehab. International)
219 East 44th Street
New York, NY 10017

International Wheelchair Road Racers Club
12710 North 30th Street, #147
Tampa, FL 33612

International Games for the Disabled, 1984
c/o Special Population Unit
Eisenhower Park
East Meadows, NY 11554

Junior Wheelchair Sports Camp
National Foundation of Wheelchair Tennis
3857 Birch Street, #411
Newport Beach, CA 92660

Mobility International, U.S.A.
P.O. Box 3551
Eugene, OR 94703

National Amputation Foundation
12-45 150th Street
Whitestone, NY 11357

National Amputee Golf Association
St. Joseph's Hospital
11705 Mercy Blvd.
Savannah, GA 31406

National Archery Association
40-24 62nd Street
Woodside, NY 11377

National Association of the Physically Handicapped
76 Elm Street
London, OH 43140

National Association of Sports for Cerebral Palsy
United Cerebral Palsy Association of Connecticut
1 State Street
New Haven, CT 06511

National Association of Sports for Cerebral Palsy
66 East 34th Street
New York, NY 10016

National Beep Ball Association
730 Hennepin Ave., Suite 301
Minneapolis, MN 55403

National Foundation for Happy Horsemanship for the Handicapped
Box 462
Malvern, PA 19355

National Foundation of Wheelchair Tennis
3857 Birch Street, #411
Newport Beach, CA 92660

National Handicapped Sports and Recreation Association
(President)
4105 E. Florida Avenue, 3rd Floor
Capital Hill Station, POB 19664
Denver, CO 80222

National Handicapped Sports and Recreation Association
(Executive director)
Farragut Station
P.O. Box 33141
Washington, DC 20033

National Inconvenienced Sportsmen's Association
3738 Walnut Avenue
Carmichael, CA 95608

National Institute on Mental Retardation
Kinsmen NIMR Bldg., York University
4700 Keele Street
Downsview, Ontario M3J 1P3

National Swimming Pool Institute
200 K Street NW
Washington, DC 20006

National Therapeutic Recreation Association
1601 N. Kent Street
Arlington, VA 22209

National Therapeutic Recreation Society
National Recreation and Park Association
1700 Pennsylvania Avenue, NW
Washington, DC 20006

National Track and Field Committee for the Visually Handicapped
33905 Calle Acordarse
San Juan Capistrano, CA 92675

National Wheelchair Athletic Association
Templeton Gap Medical Arts Center
2107 Templeton Gap Road, Suite C
Colorado Springs, CO 80907

National Wheelchair Athletic Association
Nassau Community College
Garden City, NY 11530

National Wheelchair Athletic Association
660 Capitol Hill Building
Nashville, TN 37179

National Wheelchair Basketball Association
110 Seaton Building
University of Kentucky
Lexington, KY 40506

National Wheelchair Marathon
380 Diamond Hill Road
Warwick, RI 02886

National Wheelchair Softball Association
P.O. Box 737
Sioux Falls, SD 57101

National YMCA Center for Underwater Activities
P.O. Box 1547
Key West, FL 33070

New Life, Inc.
2300 Good Hope Rd., SE, #514
Washington, DC 20020

North American Riding for the Handicapped, Inc. (NARHA)
Box 100
Ashburn, VA 22011

People-to-People Committee for the Handicapped
LaSalle Bldg., Suite 610
Connecticut Ave. and L Street
Washington, DC 20036

Regional Cerebral Palsy Games
Detroit Recreation Department
Water Board Building
735 Randolph Street
Detroit, MI 48226

Skating Association for the Blind and Handicapped, Inc. (SABAH)
3236 Main Street
Buffalo, NY 14214

Ski-For-All Foundation
521 Wall Street, Suite 326A
Seattle, WA 98121

Ski For Light, Inc.
1455 West Lake Street
Minneapolis, MN 55408

Soaring Society of America, Inc.
Box 66071
Los Angeles, CA 90066

Special Olympics
1701 K Street, NW, #203
Washington, DC 20006

Special Recreation, Inc.
362 Koser Avenue
Iowa City, IA 52240

Sport for the Physically Disabled
333 River Road
Ottawa, Ontario K1L 8B9

Travel Information Center
Moss Rehabilitation Hospital
12th Street and Tabor Road
Philadelphia, PA 19141

U.S. Amputee Athletic Association
Rt. 2 County Line Road
Fairview, TN 37062

U.S. Association for Blind Athletes
55 West California Avenue
Beach Haven, NJ 08008

U.S. Blind Golfer's Association
225 Varonne St., 28th Floor
New Orleans, LA 70112

U.S. Deaf Skiers Association
159 Davis Avenue
Hackensack, NJ 07601

U.S. Gymnastics Foundation
4545 S. East Street
Tucson, AZ 85711

U.S. Rowing Association
All-Disabled Regatta
#4 Boathouse Row
Philadelphia, PA 19130

U.S. Ski Association
Central Division
Amputee Skiers Committee
P.O. Box 66014
Chicago, IL 60666

Wheelchair Motorcycle Association
101 Torrey Street
Brockton, MA 02401

Wheelchair Pilots Association
11018 102nd Avenue, N.
Largo, FL 33540

Wheelchair Pilots Association
3953 W. Evans Drive
Phoeniz, AZ 85023

Wheelchair Sports Medicine Task Force
P.O. Box 10424
San Jose, CA 95157-1424

Women's Wheelchair Bowling
W. Bennett Avenue
Milwaukee, WI

REGIONAL AND LOCAL PROGRAMS

ALABAMA

Brower Patch Farm
Mrs. Mimi Brower
Rt. 2 Box 22-B
Hayden, AL 35079
(riding)

Mrs. Jeanne C. Cox
311 Hagood Street
Birmingham, AL 35213
(riding)

Ellis Equestrian Rehabilitation
Route 7 Box 4028
Nixon Road
Bessermer, AL 25020

Huntsville Special Riders
Jan Jeffers
P.O. Box 1962
Huntsville, AL 35807

ALASKA

Alpine Alternatives
1634 W. 13th
Anchonrage, AK 99501

Alaska Handicapped Sports & Recreation Association
Box 714
Ginwood, AK 99587

ARKANSAS

Annual Arkansas Wheelchair Basketball Games
Arkansas Handicapped Athletic Association
1700 W. 13th Street, Suite 350
Little Rock, AR 72202

ARIZONA

Therapeutic Riding of Tucson (T.R.O.T.)
Mrs. Nancy McGibbon
P.O. Box 42101
Tucson, AZ 85733

CALIFORNIA

Adaptive Recreation Program
City of Santa Barbara
620 Laguna Street
Santa Barbara, CA 83102

CALIFORNIA (Cont'd.)

Ahead With Horses
43510 Osgood Road
Fremont, CA 94538

All Seasons Riding Academy
Therapeutic Riding Program
43510 Osgood Road
Fremont, CA 94538

American Riding Club for the Handicapped
P.O. Box 64
Rancho Santa Fe, CA 92067

Amputees in Motion (A.I.M.)
1539 West 11th Avenue
Escondido, CA 92025

Berkely Outreach Recreation Program
605 Eshleman Hall
University of California
Berkeley, California 94720

California League for the Handicapped
1299 Bush Street
San Francisco, CA 94109

California Wheelchair Athletic Association
P.O. Box 26483
San Jose, CA 95159-6483

California Wheelchair Aviators
Bill Blackwood
1117 Rising Hill Way
Escondido, CA 92025

DeAnza Junior College
Adaptive Rehabilitation Physical Ed.
21250 Stevens Creek Blvd.
Cupertino, CA 95014

Environmental Traveling Companions
Fort Mason Center, Building C
Room 3B
San Francisco, CA 94123
(rafting)

Equestrian Therapy Institute
4173 Ish Drive
Simi Valley, CA 93063

Fresno Chapter, N.H.S.R.A.
2455 DeWitt Avenue
Clovis, CA 93612

Handicapped Sportsmen's Association of Sacramento
P.O. Box 194
Folsom, CA 95630

CALIFORNIA (Cont'd.)

Indoor Sports, Inc.
3445 Trumpell
San Deigo, CA 92106

Lucky Stars, The
Route 11 Box 289-A
Bakersfield, CA 93309
(riding)

Mission Bay Aquatics Center
1001 Santa Clara Point
San Diego, CA 92109
(sailing, water skiing)

N.H.S.R.A. of Fresno
2535 Millbrook Avenue
Fresno, CA 93703

N.H.S.R.A. of Southern California
7618 Woodman Avenue, Unit 13
Van Nuys, CA 91402

Operation Pegasus
2931 Beaver
Simi Valley, CA 93065
(riding)

Orange County Chapter N.H.S.R.A.
68 Monticello
Irvine, CA 92714

Orange County Riding Center, Inc.
Therapeutic Riding Program
23011 Moulton Parkway S., C-6
Laguna Hills, CA 92653

Pegasus Riding Academy for the Handicapped
77-900 Avenue of the States
Palm Desert, CA 92260

Project R.I.D.E.
8859 Southside Avenue
Baker School
Elk Grove, CA 95624

Recreational Outdoor Adventures for Disabled Students
American Red Cross - Los Angeles Chap.
1200 S. Vermont Avenue
Los Angeles, CA 90006

Recreation Center for the Handicapped, Inc.
207 Skyline Boulevard
San Francisco, CA 94132

K. Jill Rosebush
P.O. Box 5
Taylorsville, CA 95983
(riding)

CALIFORNIA (Cont'd.)

Rehab Camps, Inc.
734-A Ashbury Street
San Francisco, CA 94117

River's Crest Dragon Slayers
P.O. Box 1051
Aptos, CA 95003
(riding)

Riverside Humane Society
5791 Fremont
Riverside, CA 92504
(riding)

Santa Cruz Inconvenienced Sportspersons' Association
P.O. Box 5189
Santa Cruz, CA 95063

Southern California Wheelchair Aviators
3800 Dixie Canyon Drive
Sherman Oaks, CA 91423

Tahoe Handicapped Ski School
P.O. Box 2633
Olympic Valley, CA 95730

Therapeutic Riding for Exceptional Children
3368 West Princeton
Stockton, CA 95204

Third Wheelchair Blister Bowl
P.O. Drawer P-P
Santa Barbara, CA 93102

Jack Wada (aikido)
San Jose State University
San Jose, CA 95192

Western Amputee Golf Association
118 W. Swain Road
Stockton, CA 95207

Westwind 4-H Riding for the Handicapped
13680 Page Mill Road
Los Altos Hills, CA 94022

Sandra F. Wilson
P.O. Box 4121
Woodside, CA 94002
(riding)

Winners Astride
9755 New Avenue
Gilroy, CA 95020
(riding)

COLORADO

Act 19:11
128 North Powers Blvd.
Colorado Springs, CO 80916
(riding)

Aspen Handicapped Skiers
P.O. Box 5429
Snowmass Village, CO 81615

BOLD, Inc.
(Blind Outdoor Leisure Development)
533 E. Main Street
Aspen, CO 81611

Children's Hospital
1056 East 19th Avenue
Denver, CO 80218

Colorado Care, Inc.
P.O. Box 1942
Boulder, CO 80306

Colorado Outdoor Education Center
for the Handicapped
P.O. Box 697
Breckenridge, CO 80424

Horizons for the Handicapped
P.O. Box 2143
Steamboat Springs, CO 80477

Powderhorn Handicapped Ski Program
Powderhorn Ski Corporation
P.O. Box 1826
Grand Junction, CO 81501

Rocky Mountain Handicapped
Sportsmen's Association
Capitol Hill Station
P.O. Box 18036
Denver, CO 80218

Steamboat Equitans
Box 27
Milner, CO 80477
(riding)

Winter Park Handicapped Skier Program
Winter Park Recreational Association
P.O. Box 36
Winter Park, CO 80482

Mary Woolverton
5500 S. Steele
Littleton, CO 80121
(horsepacking)

CONNECTICUT

Alfa Handicapped Riding Program
255 Avon Mountain Road
Avon, CT 06001

Litchfield Little Britches
RFD 1, Hinman Road
Watertown, CT 06795

Lower Connecticut Valley Riding
Association
Hadlyme, CT 06439

Pegasus-Greenwich
33 Cliffdale Road
Greenwich, CT 06830
(riding)

Pegasus-New Canaan
104 Huckleberry Hill
New Canaan, CT 06840

Pegasus-Ox Ridge
Echo Hill Road
New Canaan, CT 06840

Pegasus Riding Program, Inc.
P.O. Box 2053
Darien, CT 06820

Pegasus-Weston/Westport
83 Long Lots Road
Westport, CT 06880

S.I.R.E., Inc.
Harwinton, CT 06791

United Cerebral Palsy, New London
P.O. Box 265
Waterford, CT 06385

Debra E. Yanchak
140 Ridgwood Road
West Hartford, CT 06107
(riding)

FLORIDA

Florida Horsemanship for Handicapped, Inc.
P.O. Box 14371
Gainesville, FL 32604

Kiwanis Club of Seminole
P.O. Box 3147
Seminole, FL 33542
(riding)

FLORIDA (Cont'd.)

Kiwanis-Horses and Handicapped
2200 NE 201st Street
Miami, FL 33180

Pasco Riding for Handicapped
P.O. Box 1552
New Port Richey, FL 33552

R.I.D.E.
4628 Janet Road
Cocoa, FL 32922

South Florida Chapter N.H.S.R.A.
c/o Project Masters
4770 Biscayne Blvd., Suite 900
Miami, FL 33137

Special Friends, Inc.
Route 1 Box 28
Myakka City, FL 33551

Vinceremos Riding Center
7342 Pine Park Drive
Lake Worth, FL 33463

Dennis Walters
250 Jacaranda Drive
Plantation, FL 33324
(golf)

Willow's Wheels
Rt. 1 Box 273
Morriston, FL 32668

Woodlands Lutheran Camp
Route 2 Box 137
Winter Garden, FL 32787

GEORGIA

Atlanta Chapter N.H.S.R.A.
3696 Canadian Way
Tucker, GA 30084

Special Equestrians of the CSRA
Medical College of Georgia
MT/OT Building, ER-102
Augusta, GA 30912

HAWAII

Peter Burwash International, Ltd.
2333 Kapiolani Blvd., Suite 1510
Honolulu, HI 96814
(tennis)

HAWAII (Cont'd.)

Therapeutic Horsemanship for the Handicapped
41-665D Kumauhau Street
Waimanale, HI 96795

Women's Counseling Clinic, Inc.
1314 South King, No. 708
Honolulu, HI 96814

IDAHO

C.W. Hog
Idaho State University
Box 8118
Pocatello, Idaho 83209
(rafting)

HORSEPOWER
N. 8345 Idaho Road
Post Falls, ID 83854

ILLINOIS

Animal Therapy
RR 1 Box 72
Kirkland, IL 60146

Central Illinois Three-Track Ski Club
35 Arabian Spur
Springfield, IL 62702

Chicagoland Handicapped Skiers
Rt. 1 Box 115B
Sandwich, IL 60548

Friends of Handicapped Riders
104 S. Michigan Avenue, Suite 1100
Chicago, IL 60603

Happy Hollow Fund
Box 206
Wayne, IL 60184
(riding)

Kay Nelson's Children's World
4 S 208 Curtis Street
Warrenville, IL 60555

Pegasus X of Northwestern
848 West Stephenson Street
Freeport, IL 61032

Rehabilitation Education Center
University of Illinois
Oak Street and Stadium Drive
Champaign, IL 61820

ILLINOIS (Cont'd.)

Right to Ride
RR 8 Box 62
Normal, IL 61761

St. James Riding for the Handicapped
St. James Farm
3 S 261 Winfield Road
Warrenville, IL 60555

Wayne-DuPage Hunt P.C. Riding Program for Exceptional Children
Box 206
Wayne, IL 60184

INDIANA

Bradford Woods
5040 State Road 67 North
Martinsville, IN 46151

Exeptional Equestrians of Porter County
672 Slalom Lane
Valparaiso, IN 46383

HAY
P.O. Box 2534
Bloomington, IN 47402

Loveway, Inc.
P.O. Box 181
Bristol, IN 46507

Recreation Unlimited, Inc.
10026 Vixen
Boise, IN 83705

Red Cedar Center, Special Ser.
17100 Griffin Road
Huntertown, IN 46748

Reins of Life, Inc.
250 East Bristol St., H79
Elkhart, IN 46514

Sunrise, Inc.
784 Wood Road
Richmond, IN 47374

IOWA

Recreation Education Program
University of Iowa
W. 612A East Hall
Iowa City, IA 52242

Winkelman Farms
Lohrville, IA 51453

KANSAS

Heartland's School of Riding
13333 Antioch
Overland Park, KS 66213

KENTUCKY

Central Kentucky Riding for the Handicapped
P.O. Box 8007
Lexington, KY 40533

Exceptional Equitation
3908 Charter Oaks Drive
Louisville, KY 40222

Horse
Rt. 8 Box 609A
Murray, KY 40508

Lexington-Fayette Parks and Recreation
545 North Upper Street
Lexington, KY 40508

LOUISIANA

Independence Isle
81 Egret Street
New Orleans, LA 70124

Orleans Parish 4-H Horse Club
13026 Cherbourg Street
New Orleans, LA 70129

MAINE

Leisure Center for the Handicapped
70 Forest Avenue
Portland, ME 04101

North Yarmouth Riding School
RR 2 Sligo Road
Cumberland Center, ME 04021

The Riding Mystique
Klearview Manor
Fairfield, ME 04937

MARYLAND

Carroll County 4-H Riding for the Handicapped
700 Agriculture Center
Westminster, MD 21157

F.R.E.E.
Box 224
McHenry, MD 21541

MARYLAND (Cont'd.)

Maryland Therapeutic Horsemanship Association, Inc.
P.O. Box 1031
Columbia, MD 21044

N.H.S.R.A. Nation's Capital
P.O. Box 5741
Derwood, MD 20855

Prince Georges County 4-H
PET
900 Fall Ridge Way
Grambrills, MD 21504

Riding for the Handicapped Foundation, Inc.
26315 Haines Road
Clarksburg, MD 20734

Rolling Hills Ranch
Therapeutic Riding Club
Port Deposit, MD 21904

MASSACHUSETTS

Belchertown State School
Belchertown, MA 01007

Handicapped Equestrian Center
91 Holten Street
Danvers, MA 01923

Handi-Kids
King Solomon Humanitarian Foundation for Handicapped Children, Inc.
Braintree, MA

Handi-Kids
470 Pine Street
Bridgewater, MA 02324

Massachusetts 4-H
University of Massachusetts
Amherst, MA 01003

New England Handicapped Sportsmen's Association
P.O. Box 2150
Boston, MA 02106

New England Spinal Cord Injured Foundation
369 Elliot Street
Newton Upper Falls, MA 02164

The Riding School, Inc.
275 South Avenue
Weston, MA 02193

MASSACHUSETTS (Cont'd.)

S.I.R.E., Inc.
(Self-Improvement Through Riding Education)
91 Old Bolton Road
Stow, MA 01775

Wind Gate Farm
79 Laurel Street
Paxton, MA 01612

Windrush Farm Therapeutic Equitation
Brookview Road
Boxford, MA 01921

MICHIGAN

Adapted Sports Association, Inc.
6832 Marlette Road
Marlette, MI 48453

Berrien County 4-H Horseback Riding for Handicapped
3003 East Windsor Drive
St. Joseph, MI 49085

Cheff Center for the Handicapped
RR 1 Box 171
Augusta, MI 49012

Exceptional Horseback Riders of Saginaw
Box 1714
Saginaw, MI 48605

Genesee County 4-H Horseback Riding for the Handicapped Program
G-4125 West Pasadena Avenue
Flint, MI 48504

Great Lakes Handicapped Sports Association
30628 Greenland
Livonia, MI 48154

4-H Youth Program
Horseback Riding Handicappers
Michigan State University
175 South Anthony Hall
East Lansing, MI 48824

Ingham County 4-H Horseback Riding for the Handicapped
127 East Maple
Mason, MI 48854

Michigan School for the Blind
715 W. Willow
Lansing, MI 48913

MICHIGAN (Cont'd.)

New Horizons, Handicappers
64044 Shimmel Road
Sturgis, MI 49091

N.H.S.R.A. of Michigan
4424 Pennsylvania Avenue
Lansing, MI 48910

Oakland City Horse Riders
N. Office Blvd.
1200 North Telegraph Road
Pontiac, MI 48053

Wayne County 4-H Handicappers
Riding Program
2225 Emeline Avenue
Trenton, MI 48183

MINNESOTA

Braille Sports Foundation
Room 301
730 Hennepin Avenue
Minneapolis, MN 55402

Courage Alpine Skiers
c/o Courage Center-Duluth
Duluth, MN 55802

Courage Center
3915 Golden Valley Road
Golden Valley, MN 55422

Courage Handi-Ham System
3915 Golden Valley Road
Golden Valley, MN 55422

Courage Skiers
8085 Ingleside
Cottage Grove, MN 55016

Healthsports, Inc.
1455 W. Lake Street
Minneapolis, MN 55408

Lynx Track
Box 785
Ely, MN 55731

Minnesota Outward Bound School
P.O. Box 250
Long Lake, MN 55356

North Country R.I.D.E.
2459 Becks Road
Duluth, MN 55810

Shadow Creek Ranch
6150 202nd Street, North
Forest Lake, MN 55025

MINNESOTA (Cont'd.)

Vinland National Center
3675 Induhapi Road
Loretto, MN 55357

Wilderness Inquiry, Inc.
2929 4th Avenue, S., Suite 0
Minneapolis, MN 55408

MISSISSIPPI

Jackson County Riding for the
Handicapped
P.O. Box 167
Hurley, MS 39555

MISSOURI

Riding High, Inc.
609 Thunderbird Court
Chesterfield, MO 63017

St. Louis Olympics for the
Physically Handicapped
c/o Easter Seal Society
8124 Delmar Blvd.
St. Louis, MO 63130

Therapeutic Horsemanship
Rt. 1 Box 369
Troy, MO 63379

MONTANA

Helena Riding Academy for the
Handicapped
1430 Brady Street
Helena, MT 59601

Horsepower for the Handicapped
315 South "L"
Livingston, MT 59047

Shawna Riding Academy for the
Handicapped
1226 Whispering Pines Road
Billings, MT 59101

NEVADA

City of Las Vegas
Department of Recreation and
Leisure Activity
749 Veterans Memorial Drive
Las Vegas, NV 89101

Ruby Mountain Riding for the
Handicapped
P.O. Box 656
Lamoille, NV 89828

NEVADA (Cont'd.)

Sierra Daredevils
P.O. Box 11673
Reno, NV 89510

NEW HAMPSHIRE

Highlawn Riding for the Handicapped
Kearsarge Mountain Road
Warner, NH 03279

Crotched Mountain Center
Greenfield, NH 03580

Windridge Riding for the Handicapped
P.O. Box 336
Salem, NH 03079

NEW JERSEY

Amateur Horseman's (S.T.E.E.D.)
17 Anona Drive
Upper Saddle River, NJ 07458

Handicapped High Riders
P.O. Box 229, Rt. 526
Allentown, NJ 08501

Pegasus Riding Academy
Vine Road & Central Avenue
Minotola, NJ 08341

Rehabilitation Center for the Handicapped
260 Tabor Road, Rt. 53
Morris Plains, NJ 07950

Somerset Hills Handicapped Riding
RD Larger Cross Road
Bedminster, NJ 07921

S.P.U.R.
Monmouth County Park System
Newman Springs Road
Lincroft, NJ 07738

NEW YORK

Adapted Sports Association, Inc.
P.O. Box 299
Miller Place, NY 11764

Albany Therapeutic Riding
RD 2, Martin Road
Voorheesville, NY 12168

NEW YORK (Cont'd.)

Amputee and Blind Learn-to-Ski Program
The 52 Association, Inc.
441 Lexington Avenue
New York, NY 10017

Astride
P.O. Box 295
Chittenango, NY 13037

Big M Therapeutic Riding Center
376 Route 32 South
New Paltz, NY 12561

Mrs. Margaret R. Borchert
S 317 Three Rod Road
Alden, NY 14004
(riding)

Catskill Region N.H.S.R.A.
P.O. Box 138
Shokan, NY 1248-0138

Chautauqua Challenge Therapeutic Riding Program
68 Ivory Street
Frewsburg, NY 14738

Claremont Riding Academy
175 West 89th Street
New York, NY 10024

Dutchess County YMCA
Eastman Park
Poughkeepsie, NY 12601

The 52 Association, Inc.
441 Lexington Avenue
New York, NY 10017
(outdoor sports center)

Hudson Valley Equestrian Center
Valley View Park
Box 302
Middletown, NY 10940

Hunter Mountain Handicapped Ski Program
Hunter Mountain Ski Bowl
Hunter Mountain, NY 12442

The Leonard R. Hauff Foundation for Therapeutic Riding, Inc.
RFD 3 Box 37
Peekskill, NY 10566

Long Island Riding for the Handicapped Association
286 Acre Lane
Hicksville, NY 11801

Program resources (Cont'd.)

NEW YORK (Cont'd.)

N.C. Bechtel Stables
5535 Old Goodrich
Clarence, NY 14031

NHSRA of New York
10 Westmoor Place
Binghamton, NY 13905

NHSRA of Western New York
29 Rand Avenue
Buffalo, NY 14216

Ontario County 4-H
480 North Main Street
Canadaigua, NY 14424

Outdoor Experience Education
for the Hearing Impaired
National Technical Institute
for the Deaf
Rochester Institute of Technology
1 Lamb Memorial Drive
Rochester, NY 14623

P.A.L.O.H.
4601 Henry Hudson Pkwy.
Bronx, NY 10471
(riding)

Pegasus-Bedford
Croton Lake Road
Mt. Kisco, NY 10549

Pegasus-Fox Hill
227 Kelburne Avenue, N.
Tarrytown, NY 10591

Pegasus-White Plains
23 Oxford Road
White Plains, NY 10605

Silver Wheels Wheelchair Football
109 Florence Avenue
Buffalo, NY 14214

Skidmore College Stables
Saratoga Springs, NY 12866

South East Consortium for Special
Services
51 Milton Road
Rue, NY 10580

Winslow Riding for Handicapped
Foundation, Inc.
RD 1 Box 369
Warwick, NY 10990

NORTH CAROLINA

Nantahala Outdoor Center
US 19W, Box 41
Bryson City, NC 28713

T.R.A.C.
Rt. 8, Box 630-G
Morgantown, NC 28655
(riding)

Wake Handicappers on Horses
709 Wake County C.H.
Raleigh, NC 27602

OHIO

Adaptive Sports Program
Kinesiotherapy Clinic
University of Toledo
2801 W. Bancroft Street
Toledo, OH 43606

Centaur
Cleveland Metro Park Stables
11921 Parkview Road
Brecksville, OH 44141

Chagrin Valley Therapeutic Riding
P.O. Box 144
Novelty, OH 44072

Hope on Horseback
1379 West Township Road 58
Tiffin, OH 44883

Indoor Sports Club
1145 Highland Street
Napoleon, OH 43545

Lake Erie College Riding for the
Handicapped Program
Box 369, Lake Erie College
Painesville, OH 44077

Project Ride
4740 Kingsbury Road
Medina, OH 44256

The Riding Center
1117 East Hyde Road
Yellow Springs, OH 45387

Therapeutic Riding Institute
799 Nutt Road
Spring Valley, OH 45370

Three-Trackers of Ohio
518 Lake Forest Drive
Bay Village, OH 44140

OHIO (Cont'd.)

Western Reserve Riding for the Handicapped
14115 Chardon-Windsor Road
Huntsburg, OH 44046

Windsor Hospital Equine Therapy Program
156 West Summit Road
Chagrin Falls, OH 44022

OKLAHOMA

Coffee Creek Riding Center
17 East Coffee Creek Road
Edmond, OK 73034

Tulsa Recreation Center for the Physically Limited
815 South Utica
Tulsa, OK 74104

OREGON

All Outdoors
Dept. S
P.O. Box 811
Prineville, OR 97754

Easter Seals School and Treatment Center
3575 Donald
Eugene, OR 97405

Flying Outriggers Amputee Ski Club
6423 NE 32nd Place
Portland, OR 97211

Oregon Games for the Disabled
Salem Park Department
Salem, Oregon

Outback Ranch Outfitters
Box 384
Joseph, OR 97846

Shared Outdoor Adventure Recreation
Box 14583
Portland, OR 97214

PENNSYLVANIA

Allegheny Valley Stable
RD 2 Box 2236
Mercer, PA 16137

PENNSYLVANIA (Cont'd.)

Beaver County Easter Seal Society Therapeutic Riding
Dutch Ridge Road
Beaver, PA 15009

Carousel Farms Educational Center, Inc.
226 Grenoble Road
Ivyland, PA 18974

Clarion County Horseback Riding for Handicapped
P.O. Box 230
Clarion, PA 16214

The Cort Center for the Handicapped
RD 4 Box 181
Coopersburg, PA 18036

Franklin County Horsemanship for the Handicapped 4-H Clubs
191 Franklin Farms Lane
Chambersburg, PA 17201

Gaitway
Center County Extension Service
Bellefonte, PA 16823

Gypsy Farms
P.O. Box 55
Rochester Mills, PA 15771

Handicapped Horse Power
510 Penn Street
Huntingdon, PA 16652

High Hopes, Inc.
RD 1 Box 300
Duncansville, PA 16635

Lancaster County 4-H Therapeutic Riding
Rt. 1 Box 221
Strasburg, PA 17579

Leading Leathers 4-H Easter Seal, Centre-Clinton Counties
1300 South Allen Street
State College, PA 16801

The Melmark Home, Inc.
Wayland Road
Berwyn, PA 19312

McKean County Elusive Riders Easter Seal Society
Odd Fellows Building
Bradford, PA 16701

PENNSYLVANIA (Cont'd.)

Monique, Inc.
P.O. Box 206
Honesdale, PA 18431

Monroe County Easter Seal
Society 4-H
P.O. Box 3
Stroudsburg, PA 18360

Operation Ride
195 Jackson Street
Dallas, PA 18612

Riding for the Handicapped of
Western PA, Inc.
592 Squaw Run East
Pittsburgh, PA 15238

Sebastian Riding Association
3589 B Water
Collegeville, PA 19426

Special Equestrians
Fox Hill Farm
P.O. Box 412
Pineville, PA 18946

TREC 4-H for the Handicapped
850 East Gore Road
Erie, PA 16509

Venango Area Riding for the
Handicapped
RD 4 Box 48
Franklin, PA 16323

RHODE ISLAND

South County Riding Therapeutics
South Road
Wakefield, RI 02879

SOUTH CAROLINA

Rick Ciccotto
Rt. 2 Box 589
Monck's Corner, SC 29461
(kayaking)

Dr. Phillip T. Cornelius
Administrator, Residential Program
Whitten Center, P.O. Drawer 239
Clinton, SC 29325

TENNESSEE

American Red Cross - Nashville
321 22nd Avenue North
Nashville, TN 37203

Center for Exceptional Youth
Resources and Cultural Planning
209 Norway Terrace
Nashville, TN 37211

Easter Seal Society Learning Center
3611 Midland Avenue
Memphis, TN 38111

Easter Seal Society of East Tennessee
1508 Breda Drive
Knoxville, TN 37918

Easter Seal Society - Middle Tennessee
2001 Woodmont Boulevard
Nashville, TN 37215

East Tennessee Children's Rehabilitation
Center
8042 Gleason Road
Knoxville, TN 37919

LesPasses Rehabilitation Center
49 Dunlap, North
Memphis, TN 38103

Liberty Bell Stables
P.O. Box 2282
Tracy City, TN 37387

March of Dimes Birth Defects Foundation
Music City Chapter
1720 West End Avenue
Nashville, TN 37203

March of Dimes Association
District Office
4611-A Central Avenue Pike
Knoxville, TN 37912

Recreation Ranch
Box 226
Signal, TN 37377

TEXAS

Don Drewry
College of Health, Physical
Education and Recreation
Texas Women's University
Denton, Texas 76201

Program resources (Cont'd.)

TEXAS (Cont'd.)

Freedom Ride Foundation
2141 East Southlake Blvd.
Southlake, TX 76092

Paraplegics on Independent Nature Trails (POINT)
4101 Cummings
Bedford, TX 76021

Ride On
Houston Farm and Ranch Club
11518 Wendover
Houston, TX 77024

UTAH

Cervantes Equestrian Center
RFD Box 491-B
Lehi, UT 84043

United Cerebral Palsy of Utah
2500 Emigration Canyon
Salt Lake City, UT 84108

Utah Handicapped Skiers Association
P.O. Box 108
Roy, UT 84607

VERMONT

Pine Valley Stables Riding for the Handicapped
284 Grove Street
Burlington, VT 05401

Vermont Association for Handicapped Sports and Recreation
P.O. Box 923
Burlington, VT 05402

VIRGINIA

Adventure
Virginia Easter Seal Society
P.O. Box 5496
Roanoke, VA 24012

Children's Rehabilitation Center
2270 Ivy Road
Charlottesville, VA 22901

Fairfax 4-H Therapeutic Riding Program
7709 Manor House Drive
Fairfax Station, VA 22039

Loudoun 4-H Riding
Rt. 4 Box 638
Leesburg, VA 22075

VIRGINIA (Cont'd.)

Old Dominion School of Therapeutic Horsemanship
P.O. Box 104
Great Falls, VA 22066

Shenandoah Valley Special Riding Program
71 Hawksbill Road, Mo. 194
McGaheysville, VA 22849

Winslow Riding for the Handicapped
P.O. Box 100
Ashburn, VA 22011

WASHINGTON

Camp Easter Seal Society West
17719 South Vaughn Road
Vaughn, WA 98394

EQUEST Special Riders Program
10822 Bingham Avenue, East
Tacoma, WA 98446

HELP, Inc.
19346 NW 41st Avenue
Ridgefield, WA 98642

Kelly's Special Riders
14985 256th SE
Issaquah, WA 98027

Leprechaun Arabian Neuro-Development Riding Program
12121 80th Avenue
Puyallup, WA 98371

Little Bit Special Riders Program, Inc.
19802 NE 148th Street
Woodinville, WA 98072

Partnership in Equine Therapy
Washington State University
Pullman, WA 99164

Saddle Acres Riding for the Handicapped
4524 S. Palouse Highway
Spokane, WA 99203

Seattle Handicapped Sports and Recreation Association
22231 4th Avenue SE
Bothell, WA 98011

Washington Games for Physically Disabled Children
King City Dept. Planning - Parks Div.
709 Smithtower
Seattle, WA 98104

WEST VIRGINIA

Greenbriar Center
103 Church Street
Lewisburg, WV 24901

Monogalia Riding Equestrian Center
1316 Fairfield Street
Morgantown, WV 26505

North Central Area Council of UCP, Inc.
303 Bridge Street
Clarksburg, WV 26301

WISCONSIN

Disabled Youths Sports Camp
University of Winconsin
"Rollin Hawks Sports Camp"
1004 Roseman Building
White Water, WI 53190

REINS
Lakeshore Technical Institute
1290 North Avenue
Cleveland, WI 53593

RIDE
Fox Hill Stables
7711 Midtown
Verona, WI 53593

Winconsin Badger Camp
Box 240
Platteville, WI 53818

WYOMING

Challenge-One, Inc.
P.O. Box 1033
Jackson Hole, WY 83001

Riverwind Canoeing and Kayaking
Box 2098
Jackson, WY 83001

CANADA

Alberta Amputee Ski Association
Box 1373
Banff, Alberta T0L 0C0

Alberta Sledge Hockey and Ice Picking
20 Horner Court NE
Medicine Hat, Alberta T1C 1M1

CANADA (Cont'd.)

C.A.R.D.
68 Almond Avenue
Thornhill, Ontario
(riding)

Greenbelt Riding Association for the Disabled, Inc.
790 Springland Drive, 624
Ottawa K1V 6L7

Ontario March of Dimes Sailing Program
90 Thorncliffe Park Drive
Toronto, Ontario M4H 1M5

Pacific Riding for the Disabled
21081 72nd Avenue
Langley, British Columbia

Saskatchewan Horse Foundation
Box 148
White City, Saskatchewan

Special Ability Riding Institute
RR 1, Arva
Ontario

Toronto Bulldogs Wheelchair Sports Club
c/o Lyndhurst Hospital
520 Sutherland Drive
Toronto, Ontario M4G 3X9

Track-3 Ski
Box 1260, Station Q
Toronto, Ontario 4M1 2P4

Windsor Association Riding for Handicapped
P.O. Box 5165
Windsor, Ontario

OVERSEAS

Cross-County Sled
Peter Gilomen
Sportgerate fur Behenderte
Dattenmattstrasse 5a
6010 Kriens
Switzerland

RYA Seamanship Foundation
Victoria Way, Working
Surrey GU21 1EQ
England

EQUIPMENT

AFW Company of North America
Bank of New York Building
Olean, NY 14760

Aircraft Hand Controls
Ed Stadleman
P.O. Box 207
Sturgis, KY 42459

American Foundation for the Blind
15 W. 16th Street
New York, NY 10011

Aristera Organization
9 Rice's Lane
Westport, CT 06880

Arroya Beneficial Designs
5858 Empire Grade
Santa Cruz, CA 95060
(skiing)

Bandwagon, Inc.
54 Industrial Way
Wilmington, MA 01887

Bill Blackwood
1117 Rising Hill
Escondido, CA 92025
(flying)

Cleo Living Aids
3957 Mayfield Road
Cleveland, OH 44121

Coastline Controls Corporation
414 E. Inman Avenue
P.O. Box A
Ranway, NJ 07065

Roy Dodgen Shop
Blue Eye, MO 65611
(fishing)

Dunmark Manfacturing Company
P.O. Box 266
543 Timothy Street
Newmarket, Ontario
(archery)

Fashionable
Rocky Hill, NJ 08553

Flaghouse
18 W. 8th Street
New York, NY 10011

Folbot Corporation
Stark Industrial Park
P.O. Box 70877
Charleston, SC 29405
(sledding, skiing)

The Funway Corporation
15940 Warwick Road
Detroit, MI 48223
(biking)

Hein-A-Ken Corporation
P.O. Box 56
Thief River Falls, MN 56701

Ing P.R. Hemer
Haugmannsuei, 2B
Oslo 5, Norway
(ice siedding)

International Sports Organization
for the Disabled
Stoke-Mandeville Sports Stadium
Harvy Road
Aydesbury, Buckinghamshire, England

Art Javes Designs
4914 17th Avenue
Gulfport, FL 33707
(canoeing)

Jayiro
P.O. Box 400
Waterford, CT 06385

Lee's Roll-a-Ball
(Easter Seal Society)
525 1st St. NE
Mason City, IA 50401

Lo-Rich Enterprises, Inc.
1st Street and Central Avenue
Suite 112
Miamisburg, OH 45342

Maddak, Inc.
6 Industrial Road
Pequannock, NJ 07440

G.E. Miller, Inc.
484 S. Broadway
Yonkers, NY 10705

Miya Epoch U.S.A., Inc.
P.O. Box 5191
1635 Crenshaw Road
Torrance, CA 90503

Mountain Man
720 Pront Street
Bozeman, MT 49715
(skiing)

Muir Ski Machines
11267 Weber Street
Sunnymead, CA 92388

Nelson Medical Products
5690 Saran Avenue
Sarasota, FL 33583-9510

New England Hand Cycle
228 Winchester Street
Brookline, MA 02146

North American Recreation
P.O. Box 758
Bridgeport, CT 06601

Orthopaedic Systems
Rt. 1 Box 136A
Nelsonville, OH
(cycling)

Palmer Industries
P.O. Box 707
Union Station
Endicott, NY 13760

Paul's Sports, Inc.
Rt. 1 Box 615P
Excelsior, MN 55331
(skiing)

Portable Aircraft Hand Controls
Union Aviation, Inc.
Sturgis Airport - G
Sturgis, KY 42459

J.A. Preston Corporation
60 Page Road
Clifton, NJ 07012

Precision Grinding and Manufacturing Company
80019 Flood Road
Baltimore, MD 21222

P.S.I.
125 Columbia Court
Chaska, MN 55318
(skiing)

Pulks-Vidar Johnson
Housetervin 68A
Oslo 7, Norway
(skiing)

Fred Sammons, Inc.
Box 32
Brookfield, IL 60513

S.F. Scott Manfacturing Company
Medicine Hat, Alberta T1C 1M1
(sledge hockey)

Smithsled
Mountain Smith
12790 W. 6th Place
Golden, CO 80401
(skiing)

Snitz Manfacturing Company
2096 S. Church Street
East Troy, WI 53120
(play equipment)

George Snyder
5809 NE 21st Avenue
Ft. Lauderdale, FL 33308
(bowling)

Sport Time Industries
678 Berrimen Street
Brooklyn, NY

Techni-Flair Corporation
Box 40
Cotten, AR 72626

Therapeutic Recreation Systems, Inc.
1280 28th Street, Suite 3
Boulder, CO 80303

Things From Bell, Inc.
4 Lincoln Avenue
P.O. Box 706
Cortland, NY 13045

Unicycle, Inc.
P.O. Box 276 Station N
Montreal H2X 3M4

Vargas Fishing and Rodholder
5453 Norwalk Blvd.
Whittier, CA 90601

Wheelchair Adaptations
Don Rogers, Recreation Coordinator
Methodist Hospital
Gary, IN 46402

Wilson Wheel and Tire Company
20969 Ventura Blvd, Suite 9
Woodland Hills, CA 91364

D. FUNCTIONAL CLASSIFICATIONS*

1. Amputee-based classification system developed by the United States Amputee Athletic Association for wheelchair basketball, track and field, weight lifting, and swimming.

2. Amputee-based classification modified by International Sports Organization for the Disabled (ISOD) for winter sports (1982)

   a. Alpine skiing
   b. Nordic skiing
   c. Biathlon
   d. Sledge downhill
   e. Sledge racing
   f. Sledge hockey

3. Cerebral palsy-based classification developed by National Association of Sports for Cerebral Palsy (NASCP)

   a. Track
   b. Swimming
   c. Field

4. NASCP classification modified by ISOD for winter sports (1982)

   a. Sledge downhill
   b. Sledge racing
   c. Sledge hockey

5. Classification developed by National Wheelchair Athletic Association (NWAA) for spinal cord injured and others for track and field, table tennis, slalom, swimming and weight lifting.

6. Classification developed by National Wheelchair Basketball Association (NWBA) for wheelchair basketball.

*More detailed explanations on following pages.

Functional classifications (Cont'd.)

1. Amputee-based Classification System - United States Amputee Athletic Association

General

The system is based on acquired and congenital amputations. Certain types of arm paralysis are considered functionally equal to arm amputations in some sports,according to regulations for eligibility in Sections III and IV.

Abbreviations

AK = Above or through the knee joint
BK = Below knee, but through or above the tibiotalar joint
AE = Above or through elbow joint
BE = Below elbow, but through or above wrist joint

Classification Code

Class A1	=	Double AK	Class A5	=	Double AE
Class A2	=	Single AK	Class A6	=	Single AE *
Class A3	=	Double BK	Class A7	=	Double BE
Class A4	=	Single BK	Class A8	=	Single BE *
			Class A9	=	Combined lower plus upper limb amputations

*Single arm paresis/paralysis: Minimum handicap for participation in the group of single arm amputee (A6 and A8) in air pistol, athletics and table tennis.

The muscle strength test system grades 0-5 will be used (not counting grade 1 and 2).

The following functions in the arm and hand will be tested:

Function	Maximum points
Shoulder flexion	5
Shoulder extension	5
Shoulder abduction	5
Shoulder adduction	5
Elbow flexion	5
Elbow extension	5
Wrist dorsal flexion	5
Wrist volar flexion	5
Finger flexion (fingers 2-5) at the metacarpophlanageal joints	5
Finger extension (fingers 2-5) at the metacarpophalangeal joints	5
Thumb opposition	5
Thumb extension	5
TOTAL	60

Eligible participants are those scoring 40 points are less.

Functional classifications (Cont'd.)

Comments

1. Congenital amputations of hands or feet are to be functionally classified by the medical/technical committee, especially in swimming.

2. Combinations of amputations not specified above will be placed in the class closest to actual disability. Thus an AK + BK would belong in Class A1 (wheelchair) in track, Class A1 (wheelchair) or A3 (standing) in field and table tennis according to his own choice, Class A1 or A3 in swimming depending on the length of the stump.

3. The need for increasing the number of classes (or decreasing the number of combined classes) shall be continuously observed with regard to disadvantages, actual difference in performance, and number of athletes.

2. Amputee-based classification - ISOD Winter Sports (1982)

Classification for Alpine Events

Class A1: Disability in both lower limbs and using two stabilizers

a. double above-knee amputations, prosthesis on one side

b. two normal skis tied together, two above-knee prosthesis.

c. one normal ski, below-knee prosthesis, above-knee amputation.

d. two normal skis or different skis, disability in both lower limbs other than amputation.

Notes: For safety reasons, competitors in group "d" must undergo a medical test which includes a muscular test and an inspection of the orthoses.

Class A2: Disability in one lower limb and using two stabilizers:

a. one normal ski, single above-knee amputation

b. one normal ski plus one small ski attached, disability of a lower limb.

c. one normal ski, one support for the disabled lower limb.

d. one normal ski, one free disabled lower limb.

e. one normal ski, single below-knee amputee skiing without a prosthesis

Notes: Sticks may be used instead of stabilizers. For group "d" the free limb must be attached without a prosthesis. For safety reasons, insepction of orthoses and a medical examination are required. For group "e" the competitor must present a medical certificate certifying that he is unable to wear a prosthesis.

Class A3: Disability in both lower limbs and skiing with two normal skis and two sticks:

a. double below-knee amputation.

b. disability of both lower limbs resulting in 36 to 65 points in the muscular test.

Notes: Not eligible for class A3 - lower limbs disabled/atrophied, one without and one with brace or orthosis; nerve root compression of both lower limbs. For group "b" a medical examination with a muscular test is required.

Functional classifications (Cont'd.)

Classification for Nordic Events

Class A1: Disability in both lower limbs and skiing with two skis and two sticks:

a. double above-knee amputees

b. amputation above-knee and below-knee

c. both lower limbs disabled and requiring the use of two orthoses (poliomyelitis)

Notes: For group "c" a medical examination is obligatory to ensure, among other things, that the orthoses will not endanger the competitor in any way.

Class A2: Disability in one lower limb and skiing with two skis and two sticks:

a. single above-knee amputees with a prosthesis

b. one lower limb disabled requiring the use of an orthosis

Notes: For group "b" a medical examination is obligatory to ensure, among other things, that the orthoses will not endanger the competitor in any way.

Class A3: Disabilities in the both lower limbs and skiing with two skis and two sticks:

a. double below-knee amputees

b. disabilities in both lower limbs (not requiring orthoses) resulting in 36-65 points in the muscular test*

Notes: Those who wear orthoses on both legs are not eligible in class A3.

Class A4: Disablility in one lower limb and skiing with two skis and two sticks:

a. single below-knee amputees

b. polio of one lower limb resulting in 40-65 points in the muscular test*

c. double forefoot amputees

d. lower limb disabilities requiring the use of an orthosis

e. arthrodesis of the hip

f. arthrodesis of the knee

Notes: A muscular test is necessary to classify polio disabled and other paralyzed persons. A medical examination is obligatory to ensure, among other things, that none of the orthoses will endanger the competitor in any way.

87 Functional classifications (Cont'd.)

Class A4: Disability in a lower limb and skiing with two normal skis and two sticks:

a. single below-amputation with prosthesis

b. single above-knee amputation with prosthesis

c. slight polio of one lower limb resulting in 40 to 65 points in the muscular test

d. one disabled lower limb requiring a brace (orthosis)

e. double forefoot amputation

f. arthrodesis of the knee (totally blocked knee)

Notes: Not eligible for class A4 - single amputation of a forefoot, double below-knee amputation, nerve root compression, arthrodesis of the hip, arthrodesis of the knee and hip. For groups "c", "d", "e", and "f" a medical examination is required. For group "d" the brace supporting only the foot is not eligible since alpine boots fulfil this function. Any other orthoses will be inspected for safety.

Class A5/A7 (combined for winter sports): Disability in both upper limbs and skiing with two normal skis and without sticks, the disability being such that the use of sticks is not possible:

a. double amputation of upper limbs

b. paralysis or congenital malformation of both upper limbs.

Notes: Those with both forehands amputated are not eligible.

Class A6/A8 (combined for winter sports): Disability in one upper limb and skiing with two normal skis and one stick, the disability being such that the use of more than one stick is not possible:

a. amputation of one upper limb

b. paralysis or congenital malformation of one upper limb

Note: Those with forehand amputation are not eligible.

Class A9: Disability in one upper limb and one lower limb and skiing with the equipment of their choice:

a. those disabled in one upper limb and one lower limb on the same side

b. same, but diagonal

Notes: No change of class or equipment will be permitted during a competition. No class is yet provided for those with more than two disabled limbs. For the latter, there is the possibility of competing in a class where they many be at a slight disadvantage. For example, a double upper limb amputee with a below-knee amputation could compete in class A4 or A5/A7 or A9.

Functional classifications (Cont'd.)

Class A5/A7 (combined for winter sports): Disabilities in both upper limbs and skiing with two skis but without sticks, the disability being such that the use of sticks is not possible:

a. double upper limb amputees

b. paralysis or congenital malformation of both upper limbs

c. double forehand amputees

Notes: If a competitor in class A5/A7 is able to use a stick and wishes to do so, then he must compete in class A6/A8.

Class A6/A8 (combined for winter sports): Disability in one upper limb and skiing with two skis and one stick, the disability being such that the use of more than one stick is not possible:

a. single upper limb amputees

b. paralysis or congenital malformation of one upper limb

c. single forehand amputees

Notes: The amputation of the forehand must include the whole of each finger thus making it impossible to hold a stick.

Class A9: Disability in one upper limb and one lower limb and skiing with the equipment of their choice, but using two skis:

a. those disabled in one upper limb and one lower limb on the same side

b. same, but diagonal

Notes: No changes of class or equipment will be permitted during a race. No class is yet provided for those with more than two disabled limbs. For the latter, there is the possibility of competing in a class where they may be at a disadvantage.

Classification for Biathlon Competitions

Same as for Nordic Events Classifications A1-A4

Functional classifications (Cont'd.)

Classification for Sledge Downhill

Class A1: Disability in both lower limbs:

a. double above-knee amputees

b. amputation above-knee and below-knee

c. both lower limbs disabled and requiring the use of two orthoses (poliomyelitis)

Class A2: Disability in one lower limb:

a. single above-knee amputees

b. one lower limb disabled requiring the use of an orthosis

Class A3: Disability in the extremities of both lower limbs:

a. double below-knee amputees

b. disabilities in both lower limbs (not requiring orthoses) resulting in 36-65 points in the muscular test*

Class A4: Disability in the extremity of one lower limb:

a. single below-knee amputees

b. polio of one lower limb resulting in 40-65 points in the muscular test

c. double forefoot amputees

d. lower limb disabilities requiring the use of an orthosis

e. arthrodesis of the hip

f. arthrodesis of the knee

Classification for Sledge Racing

Same as for Sledge Downhill

Classification for Sledge Hockey

Same as for Sledge Downhill

*Test available from United States Amputee Athletic Association

Functional classifications (Cont'd.)

3. Cerebral-palsy based classification - NASCP

Class I: Severe quadriplegic/triplegic-wheelchair, using electric wheelchair, more spasticity prevalent.

a. Functional profile

1. Moderate to severe spasticity in all four limbs
2. Poor functional strength and severe control problems in upper extremities and torso necessitating the use of an electric wheelchair or personal assistance for regular daily use.
3. Cannot push a manual wheelchair with their arms or legs at all.

b. Track

1. No ability to push manual wheelchair.
2. Uses electric wheelchair only for track and slalom events.
3. Maximum of 25% range of motion.
4. Maximum 90 points scored on upper extremity tests 1-5.*

c. Swimming

1. 25% limited range of motion in upper extremities
2. May use a flotation device
3. Does not score over 90 points in upper extremity tests 1-5.*

d. Field

1. Participant unable to grasp a softball with one hand, only appropriate field implements would be bean bags or small sand balls.
2. Does not have manual ability to grasp a softball or shotput.
3. 25% limited range of motion in upper extremities
4. Scores a maximum of 90 points in both upper extremities or a maximum of 60 points in either extremity.*

Class II: Severe quadriplegic-wheelchair, normally propels wheelchair with legs, better upper extremity range of motion and co-ordination than Class I, more athetosis prevalent.

a. Functional profile

1. Moderate to severe involvement in all four limbs
2. Normally wheelchair bound, cannot ambulate without assistance or with extreme difficulty.
3. Have poor functional strength and severe control problems in the upper extremities and torso.
4. Because of the varying functional abilities within this class, separate track and field events have been developed for the upper extremities and the lower extremities.

Functional classifications (Cont'd.)

Class II (Cont'd.)

b. Track (upper and lower extremity events)

1. Lower extremity track events include 60,200 and 400 meter wheelchair push via foot propulsion and a slalom course, designated Course A in slalom rules.

OR

2. Upper extremity track events include 20 meter and 60 meter wheelchair push using one or two arm wheelchair and a slalom course designated Course B in slalom rules.

   a. This competitor is unable to push a wheelchair over a long distance, has 40% limited range of motion.

   b. Does not have the functional capabilities to meet Class III criteria.

   c. Scores no more than 2 points on test 6.*

c. Swimming

1. Has 40% limited range of motion in upper extremities.
2. Ability to propel in water with limited use of all four limbs.
3. May use float device.
4. Maximum of 129 points in upper extremity tests 1-5.*

d. Field

1. There are two Class II field events: A set of upper extremity events using the club, light shotput and a set of lower extremity events using medicine ball and kick ball. Has 40% limit upper extremity range of motion.
2. Competitors in upper extremity field events have better functional ability than a Class I competitor, but do not have the range or coordination to compete equitably in Class III field events.
3. Maximum of 129 points in both extremities or maximum of 64 points in dominant extremity.*

Class III: Weak quadriplegic, triplegic - or moderate hemiplegic - wheelchair.

a. Functional profile

1. Moderate involvement in all four limbs or three limbs.
2. Have fair functional strength and moderate control problems in the upper extremities and torso.
3. Need to use wheelchair for regular daily activities but may be able to ambulate with assistive devices.

b. Track

1. No less than 60% range of motion in upper extremities.
2. Pushes wheelchair with arms.
3. Has moderate control problems and range of motion; fair to good one-arm drive.
4. Scores between 3-4 points on test 6.*

Functional classifications (Cont'd.)

Class III (cont'd.)

c. Swimming

1. Upper extremity range of motion approximately 60%.
2. Fair to moderate trunk control in water; may use float device.
3. Scores between 130-164 points in both extremities or between 65-84 points on dominant arm on tests 1-5 upper extremity test.*

d. Field

1. Able to compete in shotput (6 pounds), discus and club.
2. A hemiplegic may have upper extremity test scores greater than 84 points with good trunk control to move up into Class IV field event category.
3. Scores between 130-164 points in both extremities or between 65-84 on dominant arm.*

CLASS IV: Paraplegic; good upper extremity strength and control - wheelchair.

a. Functional profile

1. Good functional strength and minimal control problems in the upper extremities and torso (upper extremities may have exaggerated reflexes).
2. Lower limbs have moderate to severe spasticity.
3. May be able to walk short distances with use of aids, but needs wheelchair for regular daily activities.

b. Track

1. Pushes wheelchair with arms.
2. Greater than 70% range of motion in upper extremities.
3. Good strength and control.
4. Scores no less than 6 points on test 6.*

c. Swimming

1. Has good upper extremity motion in water with greater than 70% range of motion.
2. Has moderate-maximum limitations with leg propulsion and trunk control.
3. Scores between 150-179 on upper extremity test 1-5.*

d. Field

1. Able to compete in shotput (8 pounds), discus and javelin.
2. Field events performed in wheelchair.
3. Scores over 179 points in both extremities or greater than 75 points in dominant arm.*

Functional classifications (Cont'd.)

Class V: Paraplegic, moderate hemiplegic, ambulates without wheelchair in regular and daily activities. May or may not use assistive devices for ambulation. NASCP defines assistive devices as ambulatory support devices such as crutches, walkers, or canes. Braces are not considered assistive device.

a. Functional profile

1. Both lower limbs have moderate to severe spasticity causing difficulty with walking, or...
2. Right or left extremities may have moderate to severe spasticity causing difficulty with walking.
3. Have good functional strength and minimal control problems in upper extremities or in the case of the moderate hemiplegic, one arm and one leg have good functional strength while the affected side may have exaggerated reflexes.
4. May walk with or without aids but may need to use wheelchair in some daily activities.
5. Class V competitor must race on assistive devices. He/she may drop to Class VI if he/she runs without crutches.

b. Track

1. Must race on feet with assistive devices (crutches or canes).
2. Scores 0 on tests 7,8,9.*
3. May drop to Class IV wheelchair track events or move up to Class VI track.
4. Moderate hemiplegic may move to Class III wheelchair track race if Class III track criteria is met.

c. Swimming

1. Greater than 80% range of motion in upper extremity.
2. Fair leg propulsion and fair trunk control in water.

d. Field

1. An athlete may or may not use an assistive device as support for field events.
2. Scores greater than 180 points in both upper extremities or greater than 90 points in dominant arm on test 1-5 upper extremity.*

Class VI: Quadriplegic athetoid/severe triplegic, usually ambulates without walking aids, athetosis more prevalent.

a. Functional profile

1. Moderate to severe control problems in three or all four limbs.
2. Walk without assistive devices during daily activities (may wear braces).
3. Please note that Class VI has more control problems in upper extremities than a Class V; while Class VI competitors have better function in lower extremities.

Functional classifications (Cont'd.)

Class VI (Cont'd.)

b. Track

1. Races on feet without assistive devices.
2. Runs with obvious coordination difficulties.
3. Scores a maximum of three points on tests 7,8,9.*

c. Swimming

1. No more than 70% range of motion in upper arms.
2. Has poor to fair symmetric control of swim strokes and has limited to fair leg propulsion in water.
3. May have poorer functional ability in water than a Class V competitor due to poor upper extremity involvement.

d. Field

1. Performs all field events on feet without assistive devices.
2. 70% range of motion maximum on dominant arm.
3. A moderate triplegic may have the functional ability to move up into Class VII field events.
4. Scores no greater than 94 points on dominant arm in upper extremity tests.*

Class VII: Moderate hemiplegic or moderate to minimal quadriplegic.

a. Functional profile

1. Moderate spasticity in one half of body, or moderate to minimal spasticity in all four limbs.
2. Walk without assistive devices but spasticity in lower limbs may cause limp when walking.
3. Usually good functional ability in non-affected side of hemiplegic.
4. Split classes do occur occasionally in field events depending upon the degree of involvement of lower extremity in relation to the degree of involvement in upper extremities.

b. Track

1. Running increases spasticity in affected limb(s) causing limp (asymmetric action).
2. Must score between 6 and 12 points cumulative on tests 7-9 and score a maximum of 4 points on each test 7,8.9.*

c. Swimming

1. Swims exhibiting fair to good symmetric control of crawl strokes, has fair to good upper extremity movement and trunk control in water.
2. 90% range of motion for both extremities or 90-100% for dominant arm of hemiplegic.
3. Scores 120 points cumulative in upper extremities but less than 170 points. *

Functional classifications (Cont'd.)

Class VII (Cont'd.)

d. Field

1. Moderate hemiplegic may have greater range of motion in dominant arm (85-100%) than a moderate to minimal quadriplegic. Functionally they can compete together due to the poor lower extremity action and balance of hemiplegic.
2. Some Class VII competitors in track may be Class VIII in field events.
3. Must score between 6 and 12 points cumulative on tests 7-9 and score a maximum of 4 points on each test 7,8,9.*
4. Dominant arm scores no less than 95 points and no more than 108 points on dominant arm of upper extremity tests 1-5.*

Class VIII: Minimal handicap group.

a. Functional profile

1. May include a minimally affected hemiplegic, monoplegic, or a very minimally involved quadriplegic.
2. If an abnormality in a limb is only detectable on a detailed neurologic examination and there is no impairment of function obviously present, then this person does not qualify for NASCP games.
3. Able to run and jump freely.
4. May have minimal loss of full function caused by incoordination.

b. Track

1. Runs freely without noticeable limp.
2. Must score between 14 and 18 points on tests 7-9 and score a minimum of 4 points each on tests 7,8,9.*

c. Swimming

1. Good symmetrical control of major swim strokes.
2. Good upper extremity and trunk control in water.
3. 95-100% range of motion in upper extremities.
4. Scores greater than 170 points cumulative on both upper extremity test 1-5.*
5. Severe upper monoplegic becomes Class VII for swimming events.

d. Field

1. Demonstrates good blanace and symmetric form in performance
2. Must score between 14 to 18 points on tests 7-9 and score a minimum of 4 points each on tests 7,8,9.*
3. Must score no less than 95 points on dominant arm and have 100% range of motion.

*Tests available from National Association of Sports for Cerebral Palsy

Functional classifications (Cont'd.)

4. NASCP Classification Modified for ISOD Winter Sports (1982)

Classification for Sledge Downhill, Sledge Racing, Sledge Hockey

Class C4: Those with diplegia -

a. good functional strength and minimal control problems in the upper extremities.
b. lower limbs having moderate to severe spasticity.
c. able to walk short distances with the use of aids, but needing a wheelchair for normal daily activities.

Class C5: Those with moderate paraplegia, severe to moderate hemiplegia, moderate diplegia -

a. both lower limbs having moderate spasticity causing difficulty in walking.
b. having good functional strength and minimal control problems in upper extremities.
c. able to walk with or without aids but possibly needing to use a wheelchair in some daily activities.

Class C7: Those with moderate to mild lower limb disabilities -

a. able to walk without assisting devices but with spasticity in lower limbs possibly causing limping when walking.
b. good functional ability in upper limbs.

Class C8: Those with minimal disabilities -

a. having a minimally affected lower limb disability.
b. possibly having a minimal loss of full function caused by incoordination in lower limb.

Note: If an abnormality in a limb is only detectable by a detailed neurological examination and there is no impairment of function obviously present, then this person is not eligible for the Winter Games (Olympic or World Championship).

Functional classifications (Cont'd.)

5. Classification for spinal cord injured and others - NWAA

Class 1A: All cervical lesions with complete or incomplete quadriplegia who have involvement of upper extremities, weakness of triceps (up to and including grade 3 on the testing scale) and with severe weakness of the trunk and lower extremities interfering significantly with trunk balance and the ability to walk.

Class 1B: All cervical lesions with complete or incomplete quadriplegia who have involvement of upper extremities but less than 1A with preservation of normal or good triceps (4 or 5 testing scale) and with a generalized weakness of the trunk and lower extremities interfering significantly with trunk balance and the ability to walk.

Class 1C: All cervical lesions with complete or incomplete quadriplegia who have involvement of upper extremities but less than 1B with preservation of normal or good triceps (4 or 5 on testing scale) and normal or good finger flexion and extension (grasp and release) but without intrinsic hand function and with a generalized weakness of the trunk and lower extremities interfering significantly with trunk balance and the ability to walk.

Class II: Complete or incomplete paraplegia below T1 down to and including T5 or comparable disability with total abdominal paralysis or poor abdominal muscle strength (0-2 on testing scale) and no useful trunk sitting balance.

Class III: Complete or incomplete paraplegia or comparable disability below T5 down to and including T10 with upper abdominal and spinal extensor musculature sufficient to provide some element of trunk sitting balance but not normal.

Class IV: Complete or incomplete paraplegia or comparable disability below T10 down to and including L2 without quadriceps or very weak quadriceps with a value up to and including 2 on the testing scale, and gluteal paralysis.

Class V: Complete or incomplete parplegia or comparable disability below L2 with quadriceps in grades 3-5.

(b) For swimming events only, competitors with complete or incomplete paraplegia or comparable disability below L2 with quadriceps in grades 3-5 shall be classified on a point scale defined in Class V, Section 2, as follows:

Class V: up to and including 39 points
Class VI: 40 points and above.

Functional classifications (Cont'd.)

Class V (cont'd.)

(c) The unilateral amputee with an above or below the knee shall be classified according to Bylaws Article IX-1-b.*

(d) Bilateral amputees shall be classified as follows:

1. Bilateral above-knee: Class IV and V (depending on length of stump).
2. Bilateral above-knee/below-knee: Class V (dependent on length of stump).
3. Bilateral below-knee: Class VI

Section 2: The classification point system for lower extremities in classes V and VI shall be as follows:

	(R)	(L)
Hip flexor	5	5
Abductors	5	5
Extensors	5	5
Adductors	5	5
Knee flexor	5	5
Extensor	5	5
Ankle flexor	5	5
Extensor	5	5
TOTAL	40	40

Classification for weightlifting

Weightlifting is conducted in classes where body weight is the determining factor and not degree of disability. There are six categories of competitors:

1. Light featherweight — up to 112.25 pounds
2. Featherweight — up to 125.50 pounds
3. Lightweight — up to 143.25 pounds
4. Middleweight — up to 165.25 pounds
5. Light heavyweight — up to 187.25 pounds
6. Heavyweight — over 187.25 pounds

For amputees, a correction factor is introduced. Weight is calcuated by adding 1/18 body weight for below-knee amputees, and 1/9 body weight for above-knee amputees, and 1/6 for hip amputees.

*By-Laws available from National Wheelchair Athletic Association

Functional classifications (Cont'd.)

6. Classification for wheelchair basketball - NWBA

Class I: Complete motor loss at T7 or above or comparable disability where there is total loss of muscular function originating at or above T7.

Class II: Complete motor loss between T8 through L2 where there may be useful motor power of hips (hip flexors, hip adductors); however, where there is no useful motor power of the lower extremities. Hip flexors may muscle test grade good (4); hip adductors may muscle test grade fair (3); and quadriceps may muscle test grade poor (2). Also included in this class are amputees with bilateral hip disarticulation.

Class III: All other physical disabilities as related to lower extremity paralysis or paresis originating at L3 or below. All lower extremity amputees are included in this class except those with bilateral hip disarticulation.

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